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THE
PHILOSOPHY OF SCIENCE.

J. S. BARRETT.

THE
PHILOSOPHY OF SCIENCE:

A CONTRIBUTION THERETO, ON

CAUSE AND EFFECT.

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BY

T. S. BARRETT.

SECOND EDITION.

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Dedicated
TO
ALEXANDER BAIN,
GEORGE HENRY LEWES,
AND
JOHN STUART MILL,
WHOSE WRITINGS
EMINENTLY
HAVE CONTRIBUTED TO
THE RIGHT METHOD
FOR PHILOSOPHICAL INQUIRIES.



P R E F A C E.

THESE pages do not pretend to be more than a very small contribution to a most important subject. At first I had intended to write more in detail, and to follow the consequences of the subjective view of Causation into the regions of Theology and Ethics. But it was found that to do this would take up more time and thought than at present can be spared, and moreover would delay publication very considerably. Under these circumstances it has been judged better to

issue what already is in type, and thus give at once the fundamental principles of the theory.

During the last few weeks the Archbishop of York, Dr. C. M. Ingleby, Mr. H. G. Atkinson, and Mr. Samuel Neil, have kindly communicated with me on matters connected with this subject; but, to my regret, the following sheets had all been printed, and the opportunity of making additions to Chapter II. was thereby lost.

T. S. B.

GROVE LANE,
CAMBERWELL.

June 26th, 1871.

PREFACE TO SECOND EDITION.

THE first edition of these pages was entitled *A New View of Causation*. The reasons for choosing that title are given in the Introductory Chapter ; but, however suitable it might be for a *first* edition, it does not seem quite appropriate for a *second*. I have made a change accordingly.

The only other alterations in this edition occur in the Introductory Chapter ; but they are too unimportant for individual notice here. I regret that many pressing engage-

ments, at the present time, prevent my making alterations in other parts of the volume that I should have wished made—to say nothing of addition. But the present issue has been decided on rather than that the essay should remain out of print.

I ought perhaps to state (as I have, somewhat at length, examined arguments in that able and interesting work) that Mr. Lewes has, since the publication of the third edition of his *History of Philosophy*, worked out a new view of Causation. “But,” he writes, “I may say this much—that as regards your acute criticism of my *old* view I cordially accept it.”

T. S. B.

21, Grace's Road,
Camberwell, Surrey.
March 13th, 1872.

Arrangement

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NOTE.

WITH regard to the question, ‘*Must* every event have a cause?’ thinkers are divided into two great classes. Kant, Whewell and others of ‘intuitive’ and ‘idealistic’ proclivities, and Mr. W. H. Gillespie, say, ‘Yes; that every event has a cause is a necessary or apodeictic truth.’ Hobbes, Buckle, Lewes, Mill and others, on the contrary, contend that it is not a certain truth,—that, those who believe that every event has a cause, get such belief as they obtain other generalisations from experience.

In replying to the question, it seems to me that there are two paths open. One is, as is above hinted at, to institute an inquiry into the source of knowledge in general, and to see whether we have any knowledge independent of experience. The other way, made popular by David Hume—to inquire into what we mean by the term ‘cause’—is the one pursued in the following pages.

CHAPTER I.

INTRODUCTION.

CHAPTER I.

INTRODUCTION.

I. It was with no small amount of trepidation that I ventured to entitle the first edition '*A new view of causation.*' I fully felt the risk I ran of being told that had I had a little more acquaintance with the writings of my predecessors and contemporaries I should not have prided myself on discovering what others had already promulgated. It is now some years since the view

of causation ventured in the third chapter of this essay first broke on me; but in the meantime, whenever the opportunity occurred, I searched the writings of metaphysicians and logicians for the development of a similar idea. But in no case did I find exactly the same notion. The nearest approach was in the *Connection of Natural and Divine Truth*, by the late Rev. Baden Powell; but on some important points we shall be found to differ. It is true I cannot lay claim to a very extensive acquaintance with the works of philosophers; other occupations and circumstances have, to a great extent, precluded this.* But as I found that neither Mr. Mill nor Professor Bain, nor

* See Note i.

apparently any one of the latest writers, made any allusion to such a theory, I inferred that until then it had never been suggested. In any case, however, the title I adopted may have been useful in attracting notice to what, if true, must be important, and to what, if old, had seemingly fallen into unmerited oblivion.

2. For many reasons the popular idea of causation needs a thorough examination. One is, that the most momentous questions are made to depend on it. The very existence of a Deity is, with some persons, made out almost entirely from their conception of causality. The 'Argument *a priori* for the existence of a Great First Cause' by Mr. W. H. Gillespie* is a case in point. The

* See advertisement at end of volume.

a priori method in natural theology is to reason deductively and abstractedly from the notion of cause, keeping all *design* out of sight. Professor Newman has well said :*—

‘Injustice is done to the train of
‘thought which suggests Design,
‘when it is represented as *a search*
‘*after causes*, until we come to a
‘*First Cause* and there stop. As an
‘argument, this, I confess, in itself,
‘brings me no satisfaction. . . .
‘A *God* uncaused and existing from
‘eternity, is to the full as incom-
‘prehensible as a *world* uncaused
‘and existing from eternity. We
‘must not reject the latter theory,
‘merely as incomprehensible ; for
‘so is every other possible theory.
‘To believe in a divine architect,

* *The Soul*. 7th edit. p. 27.

'because I cannot *otherwise* understand by what train of causation an eye could have been made, is one thing; but to believe in a designer, because I see the eye to be suited to light, is another thing.' Now, this inference of the being of Deity, because it cannot otherwise be understood how things could exist, is the very pith of Mr. Gillespie's argument. Not a word about design—nothing but the theory of 'a *God* uncaused and existing from eternity,' in order to avoid belief in 'a *World* uncaused and existing from eternity'—a process of explanation not a whit more satisfactory than the ancient one of the earth resting on an elephant. 'Tis true that Mr. Gillespie's argument on this head is concerning the existence of *Intelligence* and not that

of *Matter* ; but as far as the reasoning is involved there is not much difference.* 'There is Intelligence in the universe,' argues Mr. Gillespie ; 'and it must either have existed from eternity, or have begun to be. And if it began to be, it must have had a cause ; for, *whatever begins to be must have a cause.*' Now, Mr. Gillespie's work professes to rest entirely on apodeictic premisses, and to be as much a demonstration as any in mathematics. Consequently, the postulate, *whatever begins to be must have a cause* (being a generalisation from contingent

* Any one reading Mr. G.'s 'demonstration' for the first time, would see the similarity with difficulty, owing to a sophistical *change of terms*. The 'demonstration' starts with the thinker's own *individual* intelligence ; but *absolute* intelligence is afterwards substituted for it. There are a few other points of difference, mention of which in this place is not necessary.

experiences and therefore not a necessary truth), is out of place in an argument aspiring to be a demonstration. This I pointed out to Mr. Gillespie;* but I could not convince him that his postulate was *not* apodeictic.

3. Now Mr. Gillespie's idea on the above point is shared by a large number of thinkers—especially perhaps by scientific men; and it has seemed to me that the only effectual method of showing its error is to make a thorough inquiry into the nature of causation in general.

* See Note ii.

APPENDIX TO CHAPTER I.

NOTES I. AND II.

APPENDIX TO CHAPTER I.

NOTE I.

(Referred to in § 1.)

A LIST OF THE PRINCIPAL WORKS WHICH HAVE BEEN READ OR CONSULTED.

Argyll (*Duke of*), *The Reign of Law*.
Atkinson and Martineau, *Letters on
the Laws of Man's Nature and
Development*.

Aristotle, *Metaphysics*.

Abercrombie, *Inquiries concerning
the Intellectual Powers*.

*An Essay upon the Relation of Cause
and Effect, controverting the Doc-
trine of Mr. Hume.* 1824.

Antitheos, *Refutation of the Argu-
ment a priori*.

*Approximations to Truth; [or] Na-
turæ Novum Organon.*

Bacon, Works.

Bailey, Letters on the Philosophy
of the Human Mind.

Bain, Mental and Moral Science.

Bain, Common Errors on the Mind.
(*Fort. Rev.* 1868.)

Bain, Logic.

Baronius, Metaphysic.

Bayle, Historical and Critical Dic-
tionary.

Beattie, Essay on Truth.

Berkeley (*Bishop*), Works of.

Bledsoe, Theodicy.

Bray, Philosophy of Necessity.

Bray, Force, and its Correlates.

Brougham, Life of Hume. [In the
Lives of Men of Letters.]

Brougham, Discourse of Natural
Theology.

Brown, Lectures.

Brucker, History of Philosophy.
(Abridged by Enfield.)

Büchner, Force and Matter.

Buckle, History of Civilisation. (*In-
trod. Vol.*)

The Future. Edited by Luke
Burke.

Butler, Works...

Campbell, Dissertation on Miracles.

Chalmers, Works.

Chalybäus, Speculative Philosophy
from Kant to Hegel.

Christmas, The Cradle of the Twin
Giants.

Clarke, Demonstration of the Being
and Attributes.

Clarke, Correspondence with Butler,
Leibnitz and others.

Clarke, Remarks on Collins's Inquiry
concerning Liberty.

Collins, Philosophical Inquiry con-
cerning Human Liberty.

Colston, Basis of Moral Science.

Combe, Relation between Science
and Religion.

Comte, Cours de Philosophie Posi-
tive.

Copleston, Enquiry into the Doc-
trines of Necessity, &c.

Crombie, Essay on Philosophical
Necessity.

D'Holbach, Système de la Nature.

Diogenes Laërtius, Lives of the
Philosophers.

Edwards, Inquiry into Freedom of
the Will.

Encyclopædia Britannica: Articles
‘Cause’ and ‘Metaphysics.’

English Cyclopædia: Article ‘Causation.’

Foster, Essays on Natural Religion.

Fowler, Mozley and Tyndall on
Miracles.

Gassendi, Discourses on Morals.

Gillespie, The Necessary Existence
of God.

Godwin, Political Justice.

Hamilton, Discussions.

Hamilton, Lectures on Metaphysics.

Hamilton, Dissertations on Reid.

Hartley, Observations on Man.

Hobbes, Works.

Hume, Philosophical Works.

Huxley, On the Physical Basis of
Life. (*Fort. Rev.* 1869.)

Huxley, Lay Sermons.

Ingleby, Introduction to Metaphy-
sic.

Irons, Analysis of Human Respon-
sibility.

Janet, Materialism of the Present
Day.

Jackson, Defence of Human Liberty.

1725.

Kaimes, Principles of Morality and Natural Religion.

Kant, Critique of Pure Reason.

Leibnitz, Correspondence with Dr. Clarke.

Leland, Deistical Writers.

Leslie, Dissertation on Mathematical and Physical Science.

Lewes, History of Philosophy.

Lewes, Physiology of Common Life.

Lewes, Aristotle.

Lewes, Comte's Philosophy of the Sciences.

Locke, Works.

Lowman, *A priori* Argument.

Macdonald, The Principia and the Bible.

McCosh, Intuitions of the Mind.

McCosh, Examination of Mill's Philosophy.

McCosh, Christianity and Positivism.

Malebranche, Search after Truth.

Mansel, Limits of Religious Thought.

Mansel, The Philosophy of the Conditioned.

Martineau (James), 'Is there any axiom of Causality?'

Masson, Recent British Philosophy.

Maurice, Moral and Metaphysical
Philosophy.

Miall, Bases of Belief.

Mill, System of Logic.

Mill, Examination of Sir W. Hamilton's Philosophy.

Mill, Dissertations and Discussions.

Mill, On Comte and Positivism.

Morrell, Modern Philosophy.

Newman, The Soul.

Nomos.

Notes on Religious, Moral and Metaphysical Subjects. *Aberdeen*. 1828.

Oswald, Appeal to Common Sense.

Paley, Works.

Parker (*Theodore*), Theism, Atheism
and the Popular Theology.

Pearson, On Infidelity.

Plato, Works.

Playfair, Dissertation on Mathematical and Physical Science.

Powell, The Connection of Natural
and Divine Truth.

Powell, The Unity of Worlds.

Powell, The Order of Nature.

Price, Review.

Priestley, Disquisitions relating to
Matter and Spirit.

Priestley, Examination of Reid,
Beattie and Oswald.

Priestley, Letters to a Philosophical
Unbeliever.

Ragg, Creation's Testimony.

Reid, Works. Edited by Sir W.
Hamilton.

Russell, 'On the Absolute,'—*Contem.*
Rev., July, 1870.

Scott, Inquiry into the Nature of
Causation. 1810.

Smith, Gravenhurst.

Stewart, Dissertation on Metaphy-
sical Science.

Stewart, Philosophy of the Human
Mind.

Stirling, Secret of Hegel.

Tappan on the Will.

Taylor, Man Responsible.

Tennemann, History of Philosophy.

Thomson, Outlines of the Laws of
Thought.

Travis, Moral Freedom reconciled
with Causation.

Tucker, Freewill, Foreknowledge
and Fate.

Tyndall, Mountaineering in 1861.

Tyndall, Fragments of Science.

Tyndall, The Constitution of the
 Universe. (*Fort. Rev.*, Dec. 1865.)
 Verity, Subject and Object.
 Voltaire, Works.
 Whately, Elements of Logic.
 Whewell, History of Scientific Ideas.
 Whewell, Novum Organum Reno-
 vatum.
 Whewell, Philosophy of Discovery.

NOTE II.

(Referred to in § 2.)

1. Mr. Gillespie's words are these:—

‘For intelligence either began to
 ‘be, or it never began to be.

‘That it never began to be, is
 ‘evident in this, that if it began to
 ‘be, it must have a cause; for, *what-
 ‘ever begins to be must have a cause.*
 ‘And the cause of Intelligence must
 ‘be of Intelligence; for, *what is not
 ‘of Intelligence cannot make Intelli-
 ‘gence begin to be,*’ &c. &c.—Div. ii.,
 part i.

2. On this I remarked :—

‘ And this Mr. Gillespie calls a demonstration! Why, the two sentences which he has italicised are very far from being necessarily true. On the former of them, especially, volumes of controversy have been written; and Mr. Gillespie simply takes it for granted!’
—*Exam. of Gillespie*, p. 13.

3. Mr. Gillespie’s rejoinder is couched in the following words :—

‘ Concerning this axiom* T. S. B. declares it is very far from being necessarily true. Again, . . . volumes of controversy have been written upon it, says T. S. B.; while the truth is, the axiom in question was at no time the subject of controversy at all. Not a single volume, not a single page [!], not a single line [!], was ever written on the topic. The axiom is so indubitable that no one ever

* ‘ Whatever begins to be must have a cause.’

‘ thought of calling it in question.
‘ Not even the greatest sceptic did
‘ so, and T. S. B. is challenged to
‘ name the author who ever at-
‘ tempted to throw doubt upon the
‘ axiomatic character of the position
‘ in hand.’ — *National Reformer*,
Oct. 10, 1869.

4. Mr. Gillespie’s challenge is one that can be very easily accepted ; and, since he will be satisfied with the name of *one* author who declines to accept his ‘ axiom ’ as a necessary truth, I need do no more than mention the name of Mr. Lewes.*

* See *Biog. Hist. of Phil.*, Chap. on Kant’s *Fund. Principles*.—*Knight’s Pocket Edition*, 1846, vol. iv. p. 131 ; *Library Edition*, 1857, p. 558.

CHAPTER II.

HISTORICAL EPITOME.

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I. 'There are,' wrote David Hume,* 'no ideas which occur in metaphysics more obscure and uncertain than those of power, force, energy, or necessary connection; of which it is every moment necessary for us to treat in all our disquisitions.' If this was true then, how much more true is it

* *An Inquiry concerning Human Understanding*, sect. vii.

now ! Since Hume put forth to the world his own peculiar views on the subject, the topic has been perpetually in a state of controversy and unsettlement. It is one of the principal *vexatæ quæstiones* of modern metaphysics, and makes its appearance, now in a treatise of logic, and now in a work on practical science. There is no ignoring it. Every writer on philosophy is obliged to mention it ; and if he does not put forward an original view of his own, he is forced to follow in the footsteps of some predecessor. Reid, Beattie, Brown, Stewart, Whewell, Hamilton, Mill, Bain, Lewes, Baden Powell, and others too numerous to mention, have treated of the question and taken sides.

2. We need not stop to inquire whether Hume or Glanvill or

Hobbes or Malebranche was the first thinker on the subject. It may roughly be considered that the controversy has more or less occupied the minds of thinkers since the revival of letters and the rise of positive science, *i.e.* since the time of Bacon and Hobbes. A coincidence may here be mentioned *en passant*, namely, that the commencement of the controversy on Causation is contemporaneous with that of the question, Philosophical Necessity *v.* Freewill. The Schoolmen and the Ancients had debated on both Causation and Necessity, but for all that they cannot be classed with moderns in these discussions. Their mode of thought is essentially at variance with ours. They talk of fate and chance ; but of what use are their thoughts on these ideas to

modern necessitarians? None whatever. They argued too on causes; but of very little use are their arguments to us. In short, we can no more class the Schoolmen and the Ancients with ourselves, when speaking of these things, than we can class Astrologers with Astronomers, or Alchymists with Chemists. We have in fact to begin entirely afresh. And to be more particular, we have to commence with Hume.

3. Hobbes, Glanvill, Malebranche, and others, had, no doubt, to a certain extent, preceded Hume;* but it is the last-named writer to whom we are indebted for general attention being drawn to the subject; and "Hume's Theory of Causation" is the name by which certain pro-

* See Note iii.

positions are now known. Whether they occurred to him spontaneously, or whether they were suggested to him by the writings of the aforesaid philosophers, is not ascertained; but one fact is certain, and that is, that it was to Hume's publication of the ideas in as paradoxical and startling a form as possible that drew attention to them.

4. What is known as Hume's Theory, says Mr. Lewes,* ' may be thus briefly stated. All our ' *experience* of causation is simply ' that of a constant succession. An ' antecedent followed by a sequent ' —one event followed by another: ' this is all that we experience. ' We attribute indeed to the antecedent a *power* of producing or

* *History of Philosophy*, vol. ii. p. 317.

‘causing the sequent; but we can
‘have no experience of such power.
‘If we believe that the fire which
‘has burned us will burn us again,
‘we believe this from habit or
‘custom; not from having per-
‘ceived any *power* in the fire. We
‘believe the future will resemble
‘the past, because custom has
‘taught us to rely upon such a
‘resemblance. “When we look about
‘us towards external objects, and
‘consider the operation of causes,
‘we are never able in a single
‘instance to discover any power or
‘necessary connection—any quality
‘which binds the effect to the cause,
‘and renders the one an infallible
‘consequence to the other. We
‘only find that the one does actually
‘in fact follow the other. The
‘impulse of one billiard-ball is

‘attended with motion in the second.
‘This is the whole that appears to
‘the outward senses. The mind
‘feels no sentiment or inward im-
‘pression from this succession of
‘objects; consequently there is not,
‘in any single instance of cause
‘and effect, anything which can
‘suggest the idea of power or neces-
‘sary connection.”* This is the
‘whole of his theory. His expla-
‘nation of our belief in power, or
‘necessary connection, is that it is
‘a matter of habit.† . . .

‘This theory of causation has
‘been hotly debated. . . .

‘When Hume asserts that expe-
‘rience gives no intimation of any
‘connection between two events, but
‘only of their *invariable conjunction*

* Hume: *Inquiry*, sect. vii.

† See Note iv.

‘ —when he says that the mind
‘ cannot perceive a causal nexus, but
‘ only an invariableness of ante-
‘ cedence and sequence, he is con-
‘ tradicted, or seems to be, by
‘ the consciousness of his readers.
‘ They declare that, over and above
‘ the fact of sequence, there is
‘ always an intimation of *power*
‘ given in every causation, and
‘ this it is which distinguishes
‘ causal from casual sequence—
‘ connection from mere conjunc-
‘ tion. The fire burns paper be-
‘ cause there is some power in the
‘ fire to effect this change. Mere
‘ antecedence, even if invariable,
‘ cannot be sufficient, or else day
‘ would be the cause of night, the
‘ flash of lightning would be the
‘ cause of the thunder-peal. Swal-
‘ lows fly close to the earth some

‘ little while before the rain falls, but
‘ no one supposes the flight of the
‘ swallows causes the fall of the
‘ rain. In every case of causation
‘ there must be an element of
‘ power—a capacity of producing
‘ the observed change—a nexus of
‘ some kind, over and above the
‘ mere juxtaposition of bodies. If
‘ diamond will cut glass, it has a
‘ power to do so ; the sharpest
‘ knife is without this power.
‘ So reason Hume’s antagonists.’

5. The question at this point resolves itself into one of definition. What do we *mean* by the terms causation, causing, cause? Reid, Beattie, Kant, and Mr. Lewes* maintain that by causing we mean producing. To this, however, Hume

* See Notes v. and vi.

has an answer ready. ‘Should any
‘one pretend to define a cause by
‘saying it is something productive
‘of another, ’tis evident he would
‘say nothing. For what does he
‘mean by *production*? Can he give
‘any definition of it that will not
‘be the same with that of causation?
‘If he can, I desire it may be pro-
‘duced. If he cannot, he here runs
‘in a circle, and gives a synonymous
‘term instead of a definition.’ And
again,—‘I begin with observing that
‘the terms of *efficacy, agency, power,*
‘*force, energy, necessity, connexion,*
‘and *productive quality*, are all nearly
‘synonymous; and therefore ’tis
‘an absurdity to employ any of
‘them in defining the rest.’* And
in accordance with this Hume

* *Treatise of Human Nature*, b. i. part iii.
sect. 2; and sect. 14.

eliminates from his definition every synonymous term, and maintains that by a cause of a phenomenon, we merely mean an event which is invariably followed by the phenomenon.

6. This is again denied by Hume's opponents. They return to their former position, that by causation we mean something more than mere invariable succession. REID and BEATTIE confess themselves unable to refute their antagonist in a philosophical manner, and take refuge in common sense, declaring that Hume's arguments are sophistical and to be placed by the side of Berkeley's, which 'admit of no answer and produce no conviction.*' These writers were the

* Hume: *Essays*, vol. ii. note n.

first antagonists of Hume, and they were, at the same time, the most thorough-going in their opposition of all dissentients. They maintained that his definition was incomplete; and that over and above the fact of invariable sequence, there is power in every cause to produce its effects. They combated the idea that we have no grounds for believing in necessary connection. They could not deny that they *perceived* nothing of such a connection; but they attributed their supposed knowledge thereof to intuition.

7. Dr. WHEWELL seems to agree mainly with Reid and Beattie on this subject. The following extract from his *Philosophy of the Inductive Sciences* is, I think, confirmatory of it:—‘David Hume asserted, that
‘we are incapable of seeing in any

‘ of the appearances which the
‘ world presents anything of neces-
‘ sary connection ; and hence he
‘ inferred that our knowledge can-
‘ not extend to any such connection.
‘ . . . We assent to his remark as
‘ to the fact, but we differ from him
‘ altogether in the consequence to
‘ be drawn from it. Our inference
‘ from Hume’s observation is, not
‘ the truth of his conclusion, but
‘ the falsehood of his premises ;—
‘ not that, therefore, we can know
‘ nothing of natural connection, but
‘ that, therefore, we have some
‘ other source of knowledge than
‘ experience.’*

8. KANT opposes Hume on grounds not materially different from those of Reid, Beattie, and Whewell. They

* *Hist. of Scient. Ideas*, vol. i. b. i.
ch. vi. art. i.

admit with Kant the facts of perception in the case; and agree with him that, nevertheless, there is a necessary connection between causes and effects; and agree with him, also, that this supposed knowledge is not derived from experience but from another source. His difference from them is, in the main, one of terminology.*

9. BROWN and STEWART come nearer to Hume's doctrine. They go so far as even to admit the soundness of his definition; but they contend that, on the other hand, we have an intuitive belief in the universality of causation. This compromise, however, is untenable. If by cause we mean nothing but a certain succession of events, 'what,' asks Dr.

* See Note xv.

Whewell, 'is the meaning of the
' maxim . . . that every event must
' have a cause? Let us put this
' maxim into the language of the
' explanation, and it becomes this :
' Every event must have a certain
' other event invariably preceding
' it '*—a proposition relatively un-
important.

10. Mr. LEWES'S reply to Hume
I have quoted at length in the
Appendix.†

11. The above may be considered
as a very meagre statement of the
controversy between the two schools
the most opposed to each other.
But there are several other solutions
of the problem, which may be re-
garded as intermediate, and more or

* *Hist. of Scient. Ideas*, b. iii. ch. ii. art. 4.

† See Note vi.

less at variance with either extreme.
For example :—

12. Mr. MILL recognises as just the criticism of those who contend that were causation simply sequence then day would be cause of night and night of day; and has accordingly modified Hume's definition by the introduction of the word 'unconditional.' Causation is with him *unconditional* invariable succession.*

13. Sir WILLIAM HAMILTON resolves causation into a corollary from the indestructibility and permanence of matter.†

14. Professor BAIN adopts Mr. Mill's definition, and at the same time gives a rendering of the relation not unlike Sir William Hamilton's.

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* See Note vii.

† See Note viii.

The *conservation of force* is closely allied, in his opinion, with the *modus operandi* of causation.*

15. The late Professor POWELL divided causes into two distinct classes. Volition he called a *moral* cause; and all others, *physical* causes. Moral causes he viewed as Reid and Beattie regarded all causes indiscriminately, namely, as *efficient* and bound by a necessary connection to their effects.† Physical causes, on the other hand, he considered in accordance with Hume's theory.

16. Mr. ATKINSON protests against the separation of causes into two classes;‡ but at the same time seems to regard all causes as equally efficient.§

17. BROWN, COMTE, and apparently

* See Note ix.

† See Note x.

‡ See Note xi.

§ See Note xii.

Mr. MANSEL,* do not dispute the assertion that all we perceive is sequence; but they regard the question, what causation *really* is, as one transcending the limits of human knowledge.

18.. DUGALD STEWART,† MALEBRANCHE, and BERKELEY, are of opinion, that the connection between causes and effects is arbitrary, and depending entirely on the will of the Deity. In some places, LEIBNITZ seems to entertain the same view; in others he appears to argue as if there were a *per se* connection.

19. The above rapid survey of the controversy shows the great differences of opinion that exist on the subject,‡ and the need there is of a disentanglement of the whole

* See Note v. † See Note xiii.

‡ See Note xiv.

question, if it can be performed. In the next chapter is stated what I conceive to be the true solution of the problem.

APPENDIX TO CHAPTER II.

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NOTES III. TO XV.

APPENDIX TO CHAPTER II.

NOTE III.

(Referred to in § 3.)

HUME'S PREDECESSORS.

1. IN Note C to his 'Elements of the Philosophy of the Human Mind,' Stewart gives the following extracts from Dr. Barrow, Butler, and Hobbes :—

2. 'If we except the mutual causality and dependence of the terms of a mathematical demonstration, I do not think that there is any other causality in the nature of things, wherein a necessary consequence can be founded. Logicians do indeed boast of I do not know

‘ what kind of demonstrations from
 ‘ external causes either efficient or
 ‘ final, but without being able to
 ‘ shew one genuine example of any
 ‘ such ; nay, I imagine it is impos-
 ‘ sible for them so to do. For there
 ‘ can be no such connection of an
 ‘ external efficient cause with its
 ‘ effect through which, strictly speak-
 ‘ ing, the effect is necessarily sup-
 ‘ posed by the supposition of the
 ‘ efficient cause, or any determinate
 ‘ cause by the supposition of the
 ‘ effect. . . . Therefore there can
 ‘ be no argumentation from an effi-
 ‘ cient cause to the effect, or from
 ‘ an effect to the cause which is
 ‘ lawfully necessary.’ — BARROW :
Mathematical Lectures.

3. ‘ It is in general no more than
 ‘ effects that the most knowing are
 ‘ acquainted with : for as to causes
 ‘ they are as entirely in the dark as
 ‘ the most ignorant.’ — BUTLER :
Sermons.

4. ‘ What we call experience is
 ‘ nothing else but remembrance of

‘ what antecedents have been followed by what consequents. . . .
 ‘ No man can have in his mind a
 ‘ conception of the future ; for the
 ‘ future is not yet ; but of our con-
 ‘ ceptions of the past we make a
 ‘ future, or rather call past, future
 ‘ relatively. . . . When a man hath
 ‘ so often observed like antecedents
 ‘ to be followed by like consequents,
 ‘ that whensoever he seeth the ante-
 ‘ cedent, he looketh again for the
 ‘ consequent, or when he seeth the
 ‘ consequent, maketh account there
 ‘ hath been the like antecedents,
 ‘ then he calleth both the antece-
 ‘ dent and the consequent signs of
 ‘ one another.’—HOBBS: *Tripes*.

5. Mr. Lewes* gives the following extract from Glanvill’s ‘ *Scepsis Scientifica* ’ :—

‘ All knowledge of causes is deductive ; for we know of none by
 ‘ simple intuition, but through the
 ‘ mediation of their effects. So that

* *Hist. of Phil.*, vol. ii. p. 317.

‘ we cannot conclude anything to be
 ‘ the cause of another but from its
 ‘ continually accompanying it ; for
 ‘ the causality itself is insensible.’

6. Berkeley, also, approaches very near to Hume. Notice the following passages :—

7. ‘ The principles whereof a
 ‘ thing is compounded, the instru-
 ‘ ment used in its production, and
 ‘ the end for which it was intended,
 ‘ are all in vulgar use termed causes,
 ‘ though none of them be strictly
 ‘ speaking agent or efficient. There
 ‘ is not any proof that an extended
 ‘ corporeal or mechanical cause doth
 ‘ really and properly act, even mo-
 ‘ tion itself being in truth a passion.’
 —*Siris*, § 155.

8. ‘ Certainly, if the explaining
 ‘ a phænomenon be to assign its
 ‘ proper efficient and final cause, it
 ‘ should seem the mechanical philo-
 ‘ sophers never explained anything.’
 —*Ib.* § 231.

9. ‘ We are not therefore seriously
 ‘ to suppose with certain mechanical

‘ philosophers, that the minute particles of bodies have real forces or powers by which they act on each other, to produce the various phenomena in nature.’—*Ib.* § 235.

10. ‘ The mechanical philosopher inquires properly concerning the rules and modes of operation alone, and not concerning the cause, forasmuch as nothing mechanical is or really can be a cause.’—*Ib.* § 249.

11. Notwithstanding the above extracts in which Berkeley seems to side with Hume, the agreement between these two thinkers does not extend much further; for Berkeley affirms that there is efficient causation somewhere, though not in phenomena themselves. To wit, in the will of the Deity.

12. Locke, also (we must not omit to mention), has a few sentences in his Essay, bearing a remarkable similarity, in some respects, to Hume’s doctrine. ‘ In the communication of motion by impulse,’

he says, 'wherein as much motion
' is lost to one body as is got to the
' other, which is the ordinarist case,
' we can have no other conception
' but of the passing of motion out
' of one body into another; which,
' I think, is as obscure and uncon-
' ceivable, as how our minds move
' or stop our bodies by thought;
' which we every moment find they
' do. The increase of motion by
' impulse, which is observed or be-
' lieved sometimes to happen, is yet
' harder to be understood. We have
' by daily experience clear evidence
' of motion produced both by im-
' pulse and by thought: but the
' manner how, hardly comes within
' our comprehension; we are equally
' at a loss in both.* But Locke's
views coincide with Hume's only a
little way: for in the same paragraph
we find the following Berkeleian sen-
timent:—'Pure spirit, viz. God, is
' only active; pure matter is only
' passive.'

* *Essay con. Hum. Und.*, b. ii. ch. 23, § 28.

NOTE IV.

(Referred to in § 4.)

HUME'S THEORY.

1. There prevails in some quarters a curious difference of opinion concerning what Hume's view really was. This disagreement is owing, in a great measure, to the fact, very often forgotten, that during his lifetime Hume put forth two separate theories, which do not coincide in all points. The first was published in the 'Treatise of Human Nature'; the last in the 'Inquiry concerning Human Understanding,' in the second volume of the 'Essays and Treatises.'

2. This variation between the two editions, so to speak, of Hume's doctrine, has naturally led to confusion. His earliest opponents—Beattie particularly—quoted exclusively from the 'Treatise'; and modern writers, when they take

their opinions of Hume second-hand, do the same. Modern writers, on the other hand, who go to Hume direct; generally quote from the 'Essays'—the 'Treatise' being more difficult to procure.

3. It was the theory as developed in the 'Treatise,' which drew so much attention to the subject, being written (evidently for that purpose) in as paradoxical and startling a manner as possible. Thus on reaching the *acmé* of his theory, Hume says:—'I am sensible, that
' of all the paradoxes, which I have
' had, or shall hereafter have occasion to advance in the course of
' this Treatise, the present one is
' the most violent.* But in the
' Inquiry' he takes an opposite tone, and goes to the other extreme of making his theory as mild as possible. He seems here afraid of saying anything to excite opposition; and, just when his conclusions are expected, he abruptly ends the es-

* *Treatise*, b. i. part iii. sect. 14.

say with :—‘I am afraid, that should
‘ I multiply words about it, or throw
‘ it into a greater variety of lights,
‘ it would only become more obscure
‘ and intricate.’*

4. It will be rightly gathered from the above that the difference between the two theories lies in the Treatise-doctrine being larger than, and including, the Essays-doctrine. In fact, the earlier work includes all the reasonings and conclusions of the later edition, with the addition of certain final inferences. It will therefore be best to exhibit first the theory as propounded in the ‘Inquiry,’ and then add the final inferences which were drawn in the ‘Treatise.’

5. The Essays-theory, then, is as follows :—‘All that we mean when
‘ we ascribe to one substance a susceptibility of being affected by
‘ another substance, is that a certain change will uniformly take
‘ place in it when that other is pre-

* *Inquiry*, sect. vii. part ii.

‘ sent ;—all that we mean, in like
 ‘ manner, when we ascribe to one
 ‘ substance a power of affecting
 ‘ another substance, is, that, where
 ‘ it is present, a certain change will
 ‘ uniformly take place in that other
 ‘ substance. Power, in short, is
 ‘ significant not of anything dif-
 ‘ ferent from the [invariable] ante-
 ‘ cedent itself, but of the mere
 ‘ invariableness of the order of its
 ‘ appearance in reference to some
 ‘ invariable consequent,—the [in-
 ‘ variable] antecedent being deno-
 ‘ minated a cause ; the invariable
 ‘ consequent an effect.’*

6. The above extract is from Dr. Brown, and pithily expresses the doctrine in Hume’s ‘ Inquiry,’ if we omit the word ‘ invariable’ in the two places I have indicated by brackets. Hume defined an effect as an invariable consequent, but not cause as an invariable antecedent. As Professor Bain points out, a severe blow on the head always

* BROWN : *Phil. of Hum. Mind*, Lect. vi.

causes death; but death is not always caused by a blow on the head.*

7. The doctrine in the 'Treatise' embraces the above interpretation of causation, with the addition of the following conclusion:—'The efficacy or energy of causes is neither placed in the causes themselves, nor in the Deity, nor in the concurrence of these two principles; but belongs entirely to the soul, which considers the union of two or more objects in all past instances. 'Tis here that the real power of causes is placed, along with their connexion and necessity.'†

8. Thus, in the 'Treatise' and in the 'Inquiry' Hume equally asserts that all we know of causation is sequence. But in the former he adds that there is no such thing as causation beyond the subjective idea, whilst in the latter he altogether omits such an inference, leaving the

* *Logic*, b. iii. chap. iv. art. 2.

† *Treatise*, b. i. part iii. sect. 14.

per se or objective nature of causation as a topic on which he does not venture to dogmatise. In other words, he does not deny, in the 'Inquiry,' the possibility of a necessary connection; he merely says we have no grounds for believing in it. There is a distinct difference between this doubt, and the denial of the 'Treatise'; the same difference that there is between the dismissal of a case for want of sufficient evidence on either side, and the verdict—'Not-Guilty; and the Accused' leaves the Court without the slightest stain on his character.'

9. This difference between Hume's two views has, there can be no doubt, caused most of the difference of opinion which has prevailed concerning the merits of his doctrine. As might have been expected, his most vehement opponents (Beattie, *e.g.*) generally quote from the 'Treatise'; whilst those who see nothing particularly extraordinary in his views, make reference to the 'Essays.'

10. The following extract from Lord Brougham's Life of Hume, is

true, if reference is to the 'Treatise,' but untrue, if it refers to the 'Inquiry':—

11. 'That we only know the connection between events by their succession one to another in point of time, and that what we term causation, the relation of cause and effect, is really only the constant precedence* of one event, act, or thing to another, is now admitted by all reasoners; and we owe to Mr. Hume the discovery, it may be well called, of this important truth. But he will not stop here:† he must deny that there can be such a thing as one act, or event, or thing, causing another: he must hold that there can be no such thing as causation, no such thing as power; he must discard from our belief those ideas which all men in all ages, have held so distinctly, and so universally, as to have given them names, specific

* The same mistake as Brown's. See *ante*, § 6.

† In the 'Essays' he *does* stop there.

‘ appellations in all languages. He
‘ denies all connection, all influence,
‘ all power, and holds it impossible
‘ that any such things should be—
‘ that any rational meaning should
‘ belong to such words.’*

NOTE V.

(Referred to in §§ 5 and 17.)

A curious circumstance is connected with the controversy on causality, viz. the remarkable grouping of opinions. Those thinkers who generally are poles asunder, are hand-in-hand upon this subject; and those who on other topics are associated, are here opposed. We shall constantly find this manifested throughout the present inquiry.

* BROUGHAM: *Men of Letters*, 3rd ed. p. 172.

NOTE VI.

(Referred to in §§ 5 and 10.)

MR. LEWES ON HUME.

1. After the statement of the theory which I have quoted in § 4, Mr. Lewes proceeds:—

2. ‘ So reason Hume’s antagonists. Nor do I think they are finally answered by resolving the idea of power into mere invariableness of antecedent and sequent; for they may reply that the invariableness itself is deduced from the idea of power: we believe the fire will invariably burn the paper because it has the power to do so, because there is a real nexus between fire and the combustion of paper; only on such a belief can our expectation of the future resembling the past be securely founded.

3. ‘ The ordinary belief of mankind in the existence of something

' more than mere antecedence and
 ' consequence is therefore a fact.
 ' This fact Hume and others admit.
 ' Because they cannot perceive the
 ' power, they declare that we have
 ' no right to believe in it. Hume
 ' insists upon the impossibility of
 ' our perceiving power—of our per-
 ' ceiving any necessary connection
 ' between two events. But, say
 ' those who oppose this theory,—
 ' Although we cannot perceive the
 ' power, we are forced to believe in
 ' it; and this belief is not a matter
 ' of custom, but is given in the very
 ' facts of consciousness. We per-
 ' ceive that *some power* is at work
 ' producing effects; the *precise na-*
 ' *ture* of this power, indeed, we
 ' cannot perceive, because we never
 ' can know things *per se*. . . .

4. ' As it is a fact that all men
 ' believe in some power involved in
 ' every causal act' [I think Mr. Lewes
 is mistaken here. Hume, in his
 ' Treatise,' maintained the opposite
 of such a belief.—T. S. B.], ' we have
 ' to ask, Is that belief well founded?

5. ' Two schools at once present

‘ themselves. The one (that of
 ‘ Hume) declares that the belief has
 ‘ no good grounds ; it is a matter of
 ‘ custom. If I believe the sun will
 ‘ rise to-morrow, it is because it has
 ‘ always risen. If I believe that fire
 ‘ will burn in future, it is because it
 ‘ has always burned. From habit I
 ‘ expect the future will resemble the
 ‘ past : I have no proof of it.

6. ‘ The other school declares
 ‘ that this belief in causation is an
 ‘ intuitive conviction that the future
 ‘ will resemble the past.’ [Dr. Bain,
 though scarcely belonging to this
 school, says what practically amounts
 to much the same thing. ‘ The
 uniformity of nature ’ is, with him,
 a First Principle, admitting of no
 analysis.*—T. S. B.] ‘ This is the
 ‘ language of Reid and Stewart.
 ‘ Dr. Whewell would have us admit
 ‘ the belief as a fundamental idea—
 ‘ a necessary truth independent of
 ‘ and superior to all experience.

7. ‘ Both explanations are ques-

* BAIN : *Logic*, b. ii. ch. v. art. 11 ; and
 append. D.

tionable. Custom or habit can essentially have nothing whatever to do with it, because our belief is as strong from a single instance as from a thousand.' [But is it? I think this may be questioned.—T. S. B.] “When many uniform instances appear,” says Hume, “and the same object is always followed by the same event, we then begin to entertain the notion of cause and connection. We then feel a new sentiment, to-wit, a customary connection in the thought between one object and its usual attendant: and this sentiment is the original of that idea which we seek for.” This is manifestly wrong. A single instance of one billiard-ball moving another suffices to originate the “sentiment,” without further repetition.’ [But the first instance of one billiard-ball moving another, which any one witnesses, is not the first case he has noticed of one object moving another. Mr. Lewes’s objection cannot hold ground unless he can prove that the very first in-

stance of one object moving another, noticed by an infant, immediately suggests causation or power to its mind.—T. S. B.] ‘Nor is there more truth in the assertion that the belief depends on conviction of the future resembling the past; this explanation assumes that the general idea precedes the particular idea. When we believe that similar effects will follow whenever the same causes are in operation—when we believe that fire will burn, or that the sun will rise to-morrow—we are simply *believing in our experience*, and nothing more. We cannot help believing in our experience: that is irresistible: but in this belief, the idea of either past or future does not enter. I do not believe that fire will burn because I believe that the future will resemble the past; but simply because my experience of fire is that it burns—that it has the power to burn. Take a simple illustration, trivial, if you will, but illustrative:—A child is presented with a bit of sugar: the sugar is

‘ white, of a certain shape, and is
‘ solid ; his experience of the sugar
‘ is confined to these properties : he
‘ puts it in his mouth ; it is sweet,
‘ pleasant : his experience is ex-
‘ tended ; the sugar he now believes
‘ (knows) to be sweet and pleasant,
‘ as well as white and solid. Thus
‘ far experience is not transcended.
‘ Some days later, another piece of
‘ sugar is given him. Is it now
‘ necessary for him to have any in-
‘ tuitive conviction that the future
‘ will resemble the past—any fun-
‘ damental idea independent of expe-
‘ rience—to make him believe that
‘ if he puts the sugar in his mouth
‘ it will taste sweet ? Not in the
‘ least : he believes it is sweet, be-
‘ cause he knows it is sweet—be-
‘ cause his experience of sugar is
‘ that it is sweet. By no effort could
‘ he divest himself of the idea of its
‘ sweetness, because sweetness forms
‘ an integral part of his idea of the
‘ sugar.’ [I agree with Mr. Lewes
that when the child receives the
second piece of sugar, it is not
necessary for him to have any ‘ in-

tuitive ** conviction that the future will resemble the past, to make him believe that if he puts the sugar in his mouth it will taste sweet. But I think it *is* necessary for him to have a 'fundamental idea,' dependent *not solely* on experience, namely, the idea, or impression, or habit of thinking, or faith (call it what you will) that nature is uniform as far as our mundane affairs are concerned. The child cannot possibly *know* that the second lump will be sweet like the first. He believes it will be, for many reasons. First;—he sees that it is taken from the bason from which the former piece was taken, and concludes that it is the same sort of substance as the former. Secondly;—hitherto his experience of things which he puts in his mouth, is that the taste is always the same, *e.g.* a piece of bread does not taste differently at different times, but always the same. Therefore he concludes that the

* Meaning by 'intuitive,' in this place,—
'independent of *all* experience.'

sugar will again taste sweet; but he does not *know* that it will. A child seeing a chameleon for the first time would naturally conclude that its colour would be the same the next time he saw it; but in this case the child's inference, as we know, might be contradicted on the next occasion of seeing the animal.

—T. S. B.] ‘ So we may say of the
‘ sun's rising: it is part and parcel
‘ of our idea of the sun. So of one
‘ billiard-ball putting a second in
‘ motion; our experience of billiard-
‘ balls is that they put each other
‘ in motion.

8. ‘ Custom has primarily nothing
‘ to do with the belief. If we had
‘ only one experience of fire—if
‘ we saw it only once applied to a
‘ combustible substance—we should
‘ believe that it would burn, because
‘ our idea of fire would be the idea
‘ of a thing which burns. Custom
‘ has, however, secondarily, some
‘ influence in correcting the ten-
‘ dency to attribute properties to
‘ things. Thus, a child sees a friend
‘ who gives him an apple. The

' next time the friend comes he is
 ' asked for an apple, because the
 ' idea of this friend is of a man
 ' who, amongst other properties,
 ' has that of giving apples. No
 ' apple is given, and this idea is
 ' destroyed. Similarly, when all
 ' our experience of things is con-
 ' firmatory of our *first* experience,
 ' we may say that habit or custom
 ' induces us to attribute certain ef-
 ' fects to certain causes. When our
 ' subsequent experience contradicts
 ' our first experience, we cease to
 ' attribute those effects to those
 ' causes which we first experienced;
 ' this is only saying that our subse-
 ' quent experience has destroyed or
 ' altered the idea we formed at
 ' first.*

9. ' While it will be admitted by
 ' the one party that between two
 ' events, named respectively cause
 ' and effect, no *nexus* is perceived
 ' by us, over and above the mere
 ' fact of antecedence and sequence;

* LEWES: *Hist. of Phil.*, vol. ii. pp. 319—
 322.

‘ and that therefore Hume is right
‘ in saying; we “only perceive this
‘ antecedence, and do not perceive
‘ the causal link”; on the other
‘ hand it must be maintained, that
‘ between those two events there is
‘ a specific *relation*, a something
‘ which makes the one succeed the
‘ other, causing this particular ef-
‘ fect rather than another; and this
‘ subtle link it is which is the nexus
‘ contended for; this relation it is
‘ which distinguishes a causal act
‘ from one of accidental sequence.
‘ There must be a peculiar rela-
‘ tion existing between oxygen and
‘ metals, otherwise metals never
‘ could be oxidised. The oxidation
‘ of iron is an effect like the ignition
‘ of paper; but it is an effect pro-
‘ ducible only through a specific
‘ relation or cause. If cause is a
‘ Relation, the reason of our in-
‘ ability to perceive it as an isolated
‘ existence, is the inability to isolate
‘ a relation from its related terms.
‘ It is not an object that can be
‘ presented to consciousness. What-
‘ ever may be the noumenal existence

‘ implied by the Relation, our phe-
‘ nomenal knowledge must ever be
‘ limited to the mere recognition of
‘ related terms. To say that we
‘ cannot perceive this Relation, and
‘ that antecedence and sequence are
‘ all that we can perceive, is only
‘ saying that we cannot penetrate
‘ beyond phenomena and their suc-
‘ cessions; but this is no more a
‘ ground for the denial of a causal
‘ nexus, than it is for the denial of
‘ an external world.

10. ‘ All things necessarily stand
‘ related to all other things; some-
‘ times these relations are obtruded
‘ on our notice, because they pass
‘ from relations of co-existence into
‘ relations of succession, and we
‘ name them causes and effects; at
‘ other times they remain in the
‘ background of unremarked co-
‘ existences, and our unsolicited
‘ attention overlooks them; we do
‘ not then name them cause and
‘ effect. The carbonate of lime,
‘ which I see before me as marble,
‘ suggests to me, in its inaction, no

‘ conception of power, or causation,
‘ because my attention is not so-
‘ licited by any successive relations ;
‘ yet, if I had witnessed the action
‘ of the carbonic acid on the lime,
‘ which originally *caused* the two
‘ substances to unite and form
‘ marble, the passage from one state
‘ to another would have suggested
‘ the idea of some power at work.
‘ It is clear that there must be rela-
‘ tions existing between the carbonic
‘ acid and the lime, which *cause* the
‘ two to remain united, as we see
‘ them in marble. We do not see
‘ these relations—we do not there-
‘ fore see the cause—but we know
‘ the cause must be in operation all
‘ the while, although in consequence
‘ of no changes taking place, we are
‘ not solicited to observe the opera-
‘ tion. Hence it is that only suc-
‘ cessive phenomena are named
‘ causal ; and hence it is that Hume
‘ was right in saying that, in a last
‘ analysis, invariableness of antece-
‘ dence and sequence is all that
‘ experience tells us of causation ;

‘ although he did not, I think, state
 ‘ this position clearly, nor discern
 ‘ its real basis.’*

NOTE VII.

(Referred to in § 12.)

MR. MILL'S DEFINITION.

1. ‘ When we define the cause of
 ‘ anything (in the only sense in
 ‘ which the present inquiry has any
 ‘ concern with causes) to be the
 ‘ antecedent which it invariably
 ‘ follows, we do not use this phrase
 ‘ as exactly synonymous with “ the
 ‘ antecedent which it has invariably
 ‘ followed in our past experience.”
 ‘ Such a mode of conceiving causa-
 ‘ tion would be liable to the objection
 ‘ very plausibly urged by Dr. Reid,
 ‘ namely, that according to this
 ‘ doctrine night must be the cause
 ‘ of day, and day the cause of night;
 ‘ since these phenomena have in-

* LEWES: *Hist. of Phil.*, vol. ii. pp. 325-6.

‘ variably succeeded one another
‘ from the beginning of the world.
‘ But it is necessary to our using
‘ the word cause, that we should
‘ believe not only that the antece-
‘ dent always *has* been followed by
‘ the consequent, but that as long
‘ as the present constitution of things
‘ endures, it always will be so. And
‘ this would not be true of day and
‘ night. We do not believe that
‘ night will be followed by day under
‘ all imaginable circumstances, but
‘ only that it will be so, *provided* the
‘ sun rises above the horizon. . . .
‘ If there be any meaning which
‘ confessedly belongs to the term
‘ necessity, it is *unconditionalness*.
‘ That which is necessary, that
‘ which *must* be, means that which
‘ will be, whatever supposition we
‘ may make in regard to all other
‘ things. The succession of day
‘ and night evidently is not neces-
‘ sary in this sense. It is condi-
‘ tional on the occurrence of other
‘ antecedents. . . .

2. ‘ Invariable sequence, there-
‘ fore, is not synonymous with

‘ causation, unless the sequence,
 ‘ besides being invariable, is uncon-
 ‘ ditional. . . .

3. ‘ We may define, therefore, the
 ‘ cause of a phenomenon to be the
 ‘ antecedence, or the concurrence
 ‘ of antecedents, on which it is
 ‘ invariably and *unconditionally* con-
 ‘ sequent.’*

NOTE VIII.

(Referred to in § 13.)

SIR W. HAMILTON'S THEORY.

1. ‘ When we are aware of some-
 ‘ thing which begins to be, we are,
 ‘ by the necessity of our intelligence,
 ‘ constrained to believe that it has
 ‘ a cause. But what does the ex-
 ‘ pression, *that it has a cause*, signify?
 ‘ If we analyse our thought, we shall
 ‘ find that it simply means, that as
 ‘ we cannot conceive any new ex-

* MILL: *System of Logic*, b. iii. ch. v. § 5.

'istence to commence, therefore, all
 'that now is seen to arise under a
 'new appearance, had previously an
 'existence under a prior form. We
 'are utterly unable to realise in
 'thought the possibility of the com-
 'plément of existence being either
 'increased or diminished. We are
 'unable, on the one hand, to con-
 'ceive nothing becoming something,
 '—or, on the other, something be-
 'coming nothing. When God is
 'said to create out of nothing, we
 'construe this to thought by sup-
 'posing that He evolves existence
 'out of Himself; we view the Creator
 'as the cause of the universe. *Ex*
 '*nihilo nihil; in nihilum nil posse*
 '*reverti* expresses, in its purest form,
 'the whole intellectual phænomenon
 'of causality.

2. 'There is thus conceived an
 'absolute tautology between the
 'effect and its causes. We think
 'the causes to contain all that is
 'contained in the effect; the effect
 'to contain nothing which was
 'not contained in the causes. Take
 'an example. A neutral salt is an

‘ effect of the conjunction of an acid
 ‘ and alkali. Here we do not, and
 ‘ here we cannot, conceive that, in
 ‘ effect, any new existence has been
 ‘ added, nor can we conceive that
 ‘ any has been taken away. . . .
 ‘ *Omnia mutantur; nihil interit*—is
 ‘ what we think, what we must think.
 ‘ This then is the mental phænomenon
 ‘ of causality,—that we necessarily
 ‘ deny in thought that the
 ‘ object which appears to begin to
 ‘ be, really so begins; and that we
 ‘ necessarily identify its present with
 ‘ its past existence.’*

3. Again,—‘ But can we think
 ‘ that quantum of existence of which
 ‘ an object, real or ideal, is the
 ‘ complement, as non-existent, either
 ‘ in time past, or in time future?
 ‘ Make the experiment. Try to
 ‘ think the object of your thought
 ‘ as non-existent in the moment
 ‘ before the present. You cannot.
 ‘ Try it in the moment before that.
 ‘ You cannot. Nor can you annihili-

* HAMILTON: *Lectures*, ii. pp. 377 8.

‘ late it by carrying it back to any
‘ moment, however distant in the
‘ past. You may conceive the parts
‘ of which this complement of ex-
‘ istence is composed, as separated ;
‘ if a material object, you can think
‘ it as shivered to atoms, sublimated
‘ into æther ; but not one iota of
‘ existence can you conceive as an-
‘ nihilated, which subsequently you
‘ thought to exist. In like manner
‘ try the future,—try to conceive the
‘ prospective annihilation of any
‘ present object,—of any atom of
‘ any present object. You cannot.
‘ All this may be possible, but of it
‘ we cannot think the possibility. . . .

4. ‘ But in this application is the
‘ principle of causality not given ?
‘ Why, what is the law of causality ?
‘ Simply this,—that when an object
‘ is presented phænomenally as com-
‘ mencing, we cannot but suppose
‘ that the complement of existence,
‘ which it now contains, has pre-
‘ viously been ;—in other words, that
‘ all that we at present come to know
‘ as an effect must previously have
‘ existed in its causes ; though what

‘ these causes are we may perhaps
‘ be altogether unable even to sur-
‘ mise.’*

5. Of all explanations of causation the above really appears the least satisfactory; but I can only add, in this place, that the reader will find in Mr. Mill’s *Examination of Hamilton* an able answer to it.

6. In § 13 Hamilton’s theory is described as a corollary from the permanence of matter. This is the objective side merely; the essence of this doctrine lies in the subjective side—what he calls an impotence of the mind. The two sides seem to me equally far from furnishing an explanation of causality—to say nothing of their questionableness as matters of fact. Curiously enough, Mr. Herbert Spencer holds Hamilton’s opinion respecting the indestructibility of matter.† This is another instance of what is mentioned in note v.

* HAMILTON: *Lectures*, ii. pp. 399—400.

† *First Principles*, 2nd ed. p. 175.

NOTE IX.

(Referred to in § 14.)

DR. BAIN'S RENDERING.

1. 'The greatest innovation [in part ii.] is the rendering of Cause by the new doctrine called the Conservation, Persistence or Correlation of Force.'—*Logic*, Preface.

2. 'A great advance, in the mode of viewing causation, is made by the modern discovery of the law named Conservation of Force.

'The great generalization of recent times, variously designated the Conservation [&c.] of *Force*, is the highest expression of Cause and Effect. In every instance of causation, there is a putting forth of force in given circumstances, and the law in question states with exactness what becomes of the force, and is often the sufficing explanation of the special phenomena, as well as the embodi-

‘ment of nature’s uniformity in
‘successions.

‘In the number and complicity
‘of causal conditions, we feel the
‘want of some principle of analysis
‘or distribution under heads. Such
‘analysis is provided in the Law of
‘Conservation; according to it, we
‘view every cause under two aspects,
‘(1) an embodiment of *moving power*
‘in given amount, and (2) a *colloca-*
‘*tion* or arrangement of circum-
‘stances, for the power to operate
‘in. These two being given, the
‘law declares the result.’—*Logic*,
b. iii. ch. iv. § 8.

3. ‘Causation, viewed as Con-
‘servation, is thus the transferring
‘or re-embodying of a definite
‘amount of Force.’—*Ib.* § 12.

4. ‘The Law of Conservation ex-
‘hausts Causation, viewed as the
‘transfer of Force or Moving Power,
‘but leaves many complicated, and,
‘as yet, unsolved questions of col-
‘location.’—*Ib.* § 13.

5. ‘Sir William Hamilton is
‘singular among metaphysicians, in

‘giving to the Law of Causation
 ‘a form almost exactly co-incident
 ‘with the principle of Conservation,
 ‘which he may be said to have
 ‘anticipated.’—*Ib.* § 17.

NOTE X.

(Referred to in § 15.)

MR. POWELL'S DISTINCTION.

1. ‘In common language, the
 ‘term *cause* is used with considerable
 ‘latitude of meaning; and even in
 ‘many discussions pretending to
 ‘a philosophic character, a slight
 ‘examination will show that it bears
 ‘several distinct kinds of signifi-
 ‘cation. We are apt to use the same
 ‘word, and thence imagine that
 ‘we are speaking of the same thing,
 ‘in cases which are essentially
 ‘different. . . .’

2. ‘We may say the cause of the
 ‘motions of a watch is the tendency
 ‘of the main-spring to unwind itself;

‘ and the cause of the flight of the
‘ cricket-ball is the voluntary effort
‘ of the player. These are two in-
‘ stances which would seem, at first
‘ sight, closely to resemble each
‘ other; but when accurately ex-
‘ amined, we find an important
‘ distinction between them. In the
‘ former instance, we trace the order
‘ of dependence of the motions from
‘ the index to the wheels, from the
‘ wheels to the fusee, and so up to
‘ the tendency of the spring to un-
‘ wind; and this we refer to the
‘ property of elasticity; which again
‘ may possibly depend on some still
‘ higher principle in the nature and
‘ arrangement of the particles of
‘ which elastic bodies are composed.
‘ But to whatever extent we may
‘ advance in thus analysing the effect
‘ up to its simplest elements, one
‘ thing is all along manifest; viz.
‘ that the very highest principle of
‘ any such series must essentially
‘ be some general, fixed, inherent,
‘ property of matter; by virtue of
‘ which it is capable of being in-
‘ fluenced in particular ways, and

‘ by particular agents ; but yet is
 ‘ wholly *inert*, and incapable of arbi-
 ‘ trarily originating any of the effects
 ‘ referred to.

3. ‘ In the second case, we may
 ‘ observe, it is true, a like series of
 ‘ effects in succession dependent one
 ‘ on another. Motion is communi-
 ‘ cated mechanically to the ball from
 ‘ the sudden action of the arm ; this
 ‘ results from the contraction of the
 ‘ muscles acting on the bones as
 ‘ levers ; the muscular contraction
 ‘ again may be shown to depend
 ‘ on some peculiar influence of the
 ‘ nerves ; this again may possibly be
 ‘ traced to some higher principle ;
 ‘ we may advance, in short, as far
 ‘ as physiological science can carry
 ‘ us ; and thus far, this and the
 ‘ former case are exactly alike. But
 ‘ here at the commencement of the
 ‘ whole train, there must still be an
 ‘ influence or cause of some kind
 ‘ different from any mechanical
 ‘ power ; depending on *voluntary*
 ‘ agency ; capable of originating the
 ‘ series of consequences from itself ;
 ‘ acting by different laws from those

‘ of matter ; in a word, an agency
‘ or influence of a *moral* kind. . . .

4. ‘ Such a voluntary agency,
‘ such an influence or power, of
‘ which we feel conscious, and which
‘ implies the action (however incom-
‘ prehensible) of mind on matter, is
‘ what we may properly distinguish
‘ by the term *moral causation*. The
‘ former case we may call, by way
‘ of contradistinction, an instance
‘ of *physical causation*. In the study
‘ of causes acting in the natural
‘ world, we must carefully observe
‘ this distinction. Cases where
‘ voluntary or moral agency is con-
‘ cerned, can only be considered in
‘ physical inquiry so far as they
‘ properly come under the laws of
‘ inert matter, or belong to those
‘ kinds of *physical* action which
‘ are the subjects of dynamical or
‘ chemical research. To go beyond
‘ this is to confound physical causes
‘ with moral, physical science with
‘ metaphysical.’—*The Connexion of*
Natural and Divine Truth, sec. ii.
pp. 78—82.

NOTE XI.

(Referred to in § 16.)

MR. ATKINSON'S VIEW.

‘ Men have been wandering amidst
‘ poesies, theologies and metaphysics,
‘ and have been caught in the web
‘ of ideal creations, and have to be
‘ brought back again to particulars
‘ and material conditions; to investi-
‘ gate the real world, and those laws
‘ of being and action which are the
‘ form and nature of things, and the
‘ phenomena which they present, as
‘ they are here, within us and about
‘ us in reality and in truth, and not
‘ as we would fancy them to be.
‘ There are not two philosophies,
‘ one for Mind and another for
‘ Matter. Nature is one, and to be
‘ studied as a whole. “There is
‘ nothing in nature,” says Bacon,
‘ “but individual bodies, exhibiting
‘ clear individual effects, according to
‘ particular laws.” Instinct, passion,

‘ thought, &c., are effects of organ-
 ‘ ised substances: but men have
 ‘ sought to make out a philosophy
 ‘ of mind, by studying these effects
 ‘ apart from causes, and have even
 ‘ asserted that mind was entirely
 ‘ independent of body, and having
 ‘ some unintelligible nature of its
 ‘ own, called free will,—not subject
 ‘ to law, or dependent on material
 ‘ conditions; though a man has no
 ‘ more power to determine his own
 ‘ will than he has wings to fly.’—
Man’s Nature and Development, First
 Letter to Miss Martineau, pp. 5—6.

 NOTE XII.

(Referred to in § 16.)

DISCUSSION ON LAW.

1. The following extracts are from the *National Reformer* newspaper—a journal devoted to the advocacy of opinions very shocking to the respectable and higher classes: atheism, republicanism, and malthu-

sianism. However, one thing at least may be granted in its favour: viz. the editor's impartial admittance into its columns of metaphysical articles at variance with his own views.

2. 'Will any metaphysician, either
'on the spiritual or materialistic
'side, define Power—(not as Hegel
'does law or justice though—as
'annihilation of annihilation) ?'—
B. T. W. R., *Nov.* 3, 1867.

3. 'Hume has long ago answered
'it [*i.e.* this question] for us. When
'we examine into any instance of
'what we call cause and effect, and
'try to discover wherein the *Power*
'consists, we find that we can dis-
'cover nothing but sequence. . . .
' . . . Comte tells us to confine our-
'selves to phenomena, and not to
'waste our time in seeking the causes
'of things which are beyond the grasp
'of the human understanding. Comte
'was not right in everything he said ;
'but this is one of the true principles
'of Science, which he, in common

‘with other philosophers, has correctly discerned.’—T. S. B., *Nov.* 10, 1867.

4. ‘What is truth? Iconoclast tells us that extension is only a quality of substance. Mr. Simon continues to assert that the substance as well as the extension is but a quality of mind. Mr. Bray, of Coventry, as well as Mr. Wyld, of Edinburgh, in elaborate and learned arguments declare that there is no such thing as matter, that both matter and mind are but conditions of force; whilst T. S. B. now assures us that this supposed force itself has no existence, and he gives Hume and Comte as his authority for asserting that we have no reason for believing that anything exists beyond the sequence.’—H. G. ATKINSON, *Nov.* 24, 1867.

5. ‘B. T. W. R. wishes for a definition of Power. May I suggest that power is simply an innate principle or attribute of matter, or rather it is the physical action

‘itself; and the notion, or rather
‘feeling, that power is a something
‘distinct from matter, is merely an
‘illusion of the muscular sense as
‘shown by Brown long ago. To say
‘that matter is force is the same as
‘to say that force is matter—it is
‘simply a choice of terms—and the
‘idea that matter would be inert
‘except for a something else push-
‘ing behind, or carrying it along, is
‘absurd, and an attempt to explain
‘a plain fact by some other imagi-
‘nary fact, quite unintelligible and
‘itself unexplained, and which is
‘but riding our elephant again upon
‘the back of the tortoise. The
‘*spiritual* medium of action between
‘bodies is not immaterial, but in-
‘finitely material, throughout Nature
‘as affirmed by Bacon and Hobbes,
‘and by Newton, and now clearly
‘demonstrated in modern astro-
‘nomy. If we are not satisfied to
‘recognise the ability or power of
‘matter in the actions themselves,
‘with the mental sense of the same,
‘we find no other fact or argument
‘to help us further, and shall come

‘to perceive that the supposed need
‘is nothing but a mental fiction.’—
H. G. ATKINSON, *Dec.* 8, 1867.

6. ‘As for a law independent of
‘power, it is fatuity to talk of it.
‘We don’t know that there is any
‘law; but power is certain. Hume’s
‘idea of sequence gives us little
‘light. Indeed it is simple nega-
‘tion, but it cannot disprove the
‘fact’ [*query*, “of Power existing” ?].
‘It were about as rational to prove
‘our own being by “*Cogito, ergo*
‘*sum*” as to prove the existence
‘of power.’—B. T. W. R., *Dec.*
22, 1867.

7. ‘There is a good deal of mis-
‘conception afloat as to what we
‘know under the name of Physical
‘Laws. The Duke of Argyll has
‘done good service by his *Reign of*
‘*Law* in the diffusion of a correcter
‘knowledge on this subject; but
‘even his Grace is not quite perfect.
‘B. T. W. R. writes in the *N. R.*
‘for *Dec.* 22nd, that we have cer-
‘tain knowledge of the existence of

‘ power, but not of the existence of
‘ law. (The converse would have
‘ been more true.) But has he a
‘ clear idea of what is meant by the
‘ term, Law, when he makes such a
‘ statement? I can scarcely think
‘ so. Law—natural law—is Order,
‘ nothing else. We discover (either
‘ directly, by observation; or in-
‘ directly, by reason) certain regu-
‘ larities or order in phenomena.
‘ This regularity, or this order, we
‘ call a *Law*—a Law of Nature. . .

8. ‘ It is frequently said that an
‘ event happens in consequence of a
‘ law of nature. But, strictly, such
‘ an expression must be considered
‘ incorrect. The phrase does very
‘ well as long as it is not misunder-
‘ stood; but there will be the danger
‘ that more is inferred from the
‘ words than what ought only to be
‘ understood. In popular language
‘ the conclusion of a syllogism is
‘ said to be true, in consequence of
‘ the truth of the premisses. In
‘ one sense this is so; but it must
‘ be borne in mind that in reality
‘ the premisses contain the con-

‘ clusion, and that consequently all
‘ syllogistic reasoning is a *petitio*
‘ *principii*. Thus, in the reasoning,
‘ “All men are mortal, and therefore
‘ Augustus is mortal,”—*Augustus*, in
‘ the conclusion is included in the
‘ *All men* of the premiss : and there-
‘ fore the premiss cannot be rightly
‘ called the cause of Augustus’s mor-
‘ tality. Precisely so also with what
‘ are called the Laws of Nature.
‘ They stand in just the same re-
‘ lation to individual phenomena as
‘ the major premiss stands to the
‘ conclusion in a syllogism of the
‘ first figure. They are wider. The
‘ mortality of mankind might, for
‘ example, be called a Law, and the
‘ mortality of Augustus a fact under
‘ that Law. And so with all
‘ other laws of nature. They are
‘ merely ascertained regularities—a
‘ class or order of events. And con-
‘ sequently they are of all degrees of
‘ wideness. The term Law is re-
‘ lative, just as Class, Genus, Species
‘ are. A Law of Nature is a *Law*,
‘ if viewed in relation to instances
‘ under it, but becomes itself an in-

‘dividual instance when viewed in
‘relation to still wider Laws or
‘generalizations. And thus Nature
‘presents the appearance of a vast
‘and complicated piece of machinery
‘containing wheels within wheels;
‘for here we have Laws within
‘Laws.’—T. S. B., *Jan.* 5, 1868.

9. ‘A word with my friend T. S. B.,
‘who says that the laws of nature
‘are merely an ascertained regu-
‘larity, a class or order of events.
‘No doubt regularity and uniformity
‘is a fundamental law of nature and
‘of the principles and forms and
‘objects, and all other material con-
‘ditions, as well as of the sequence
‘of events; but to confound the re-
‘gularity of the sequence with the
‘law or principle of the action itself,
‘and to say that the laws of gravity
‘and the principles of the triangle
‘are a mere class or order of events,
‘is dealing in abstractions when we
‘want to get at the nature of the
‘laws or forms of the entities and
‘actions themselves. May as well
‘say that an object is the space it

‘ occupies, as that the sequence or
‘ order is the law itself. . . . Of
‘ the fundamental character and con-
‘ dition of matter we know nothing,
‘ and cannot possibly know any-
‘ thing; the fact is beyond the limits
‘ of our powers of perception and of
‘ thought altogether; but the uni-
‘ formity of the relations of things
‘ and of events, we can and do ob-
‘ serve, and the form of these rela-
‘ tions we term law. Whatever ex-
‘ ists must have a form of being and
‘ of action. It cannot be what it is
‘ not; but must be subject to the
‘ form or law of its constitution, or
‘ it would be something else, which
‘ is nonsense. And the form and
‘ principle of this being or action
‘ we term law, and it is and must
‘ be uniform and regular.’—H. G.
ATKINSON, *Jan.* 12, 1868.

10. ‘ Mr. Atkinson says that a
‘ Law of Nature is something more
‘ than a general fact, but he does
‘ not tell us what else it is. I have
‘ tried hard to discover what this
‘ extra quality can be, but in vain.

‘ A Law of Nature and a General
 ‘ Fact seem to me to be convertible
 ‘ terms. What is the Law of Gravi-
 ‘ tation? A general fact, namely,
 ‘ that bodies attract each other
 ‘ directly as the mass, and in-
 ‘ versely as the square of the dis-
 ‘ tance. What are Kepler’s Laws?
 ‘ “Simply and purely an *Order of*
 ‘ *Facts* established by observation.”*
 ‘ And so with all other . . . Laws.’
 —T. S. B., *Feb.* 2, 1868.

11. ‘ T. S. B. seems to see that
 ‘ his former wording of his definition
 ‘ of Law cannot be upheld, so has
 ‘ worded it afresh, and now says
 ‘ that a Law of Nature is a general
 ‘ fact. But are there no *particular*
 ‘ Laws, as when Bacon said, “There
 ‘ is nothing in Nature but indi-
 ‘ vidual bodies, exhibiting clear in-
 ‘ dividual effects according to par-
 ‘ ticular laws”? And in regard
 ‘ to the uniformity of the rule of
 ‘ Nature in the reign of law, is it

* DUKE OF ARGYLL: *Reign of Law*. 1st
 ed. p. 67.

‘ not the fixity of the law and principle of action, as in this instance by the laws of gravity, that is the cause or reason of the uniformity ? . . . Of course a Law is a Fact (what is not ?), be it a particular law, a general law, or, like the law of uniformity, a universal law. But Laws are not abstractions, but the nature, property or principles (call it as you will,) . . . of the substance or body in question, exhibited in the effects, but determined by an active principle inherent in the material.’—H. G. ATKINSON, *Feb.* 16, 1868.

12. ‘ Mr. Atkinson says I saw my former definition could not be upheld. That is a mistake, for I now repeat it. We apply the term Laws of Nature to the Uniformities or the Rules or the General Facts or the Universal Occurrences or the Order of Events (for all these phrases are of the same meaning) which we find in phenomena. Mr. Atkinson asks, Are there no particular laws? That depends on

‘ what he means by particular. Perhaps he would call Kepler’s Laws particular, because they apply only to the planets. . . . These terms are relative. A Law, Order or Uniformity observable throughout the whole Animal Kingdom is a less Law than one observable throughout the whole of material things, but a greater Law than one applicable to quadrupeds merely.’—
T. S. B., *March 1*, 1868.

13. ‘ T. S. B. persists in the assertion that the Laws of Nature are merely the regularity or order observed and not any principles on which such order must depend, and of which in fact the order is the consequence. . . . Of course all Laws are uniform in their action, but nevertheless the uniformity is not the laws on which it depends,—general truths are not the principles on which they rest, —and matter and its laws of existence and action admit of no divorce.’—H. G. ATKINSON, *March 8*, 1868.

14. ' The difference between Mr. Atkinson and myself is merely a question of terms. I apply the name *Laws* to the rules or general facts observed among phenomena ; Mr. Atkinson, on the other hand, applies the term to the inherent principles in matter on which the phenomena depend. . . . Dr. Fleming says,—“ The word Law expresses the constant and regular order according to which an energy or agen operates ”—*not*, (as Mr. Atkinson would say) the energy or agent itself—if there be such a thing.’—T. S. B. *March* 29, 1868.

15. ' T. S. B. misrepresents my statements. . . . He quotes from Dr. Fleming the following passage, —“ The word Law expresses the constant and regular order according to which an energy or agent operates, [” and adds,—“] *not*, as Mr. Atkinson would say, the energy or agent itself, if there be such a thing.” Now I have made no such statement as that the Law or Principle of action is the energy

‘ or agent itself. But Mr. B. seems
 ‘ to suppose there may even—for
 ‘ aught he can tell—be no cause or
 ‘ agent at all, but an uncaused order
 ‘ resting on no principle as a reason.
 ‘ . . . But what we must recognise
 ‘ as men of science is a substance
 ‘ of material nature as a basis, with
 ‘ its essential and necessary law or
 ‘ principle of action, determining all
 ‘ phenomena. . . . And therefore
 ‘ Mr. Grove is quite justified in
 ‘ speaking of Force as meaning
 ‘ “that active principle inseparable
 ‘ from matter, which induces its
 ‘ various changes.” I do not say,
 ‘ nor does Mr. Grove mean, that the
 ‘ active principle inseparable from
 ‘ the matter is the matter itself;
 ‘ and those who cannot draw the
 ‘ distinction between the order of
 ‘ nature, the law or principle on
 ‘ which such order depends, and the
 ‘ matter acting, must, I think, be
 ‘ wanting in the fundamental faculty
 ‘ essential to a philosopher.’—H. G.
 ATKINSON, *April 5, 1868.*

NOTE XIII.

(Referred to in § 18.)

EXTRACT FROM STEWART.

1. ' Mr. Hume had the merit of
' shewing clearly to philosophers,
' that our common language, with
' respect to cause and effect, is
' merely analogical; and that if
' there be any links among physical
' events, they must for ever remain
' invisible to us. If this part of his
' system be admitted; and if, at the
' same time, we admit the authority
' of that principle of the mind, which
' leads us to refer every change to
' an efficient cause; Mr. Hume's
' doctrine seems to be more favourable
' to theism, than even the common
' notions upon this subject;
' as it keeps the Deity always in
' view, not only as the first, but as
' the constantly operating efficient
' cause in Nature, and as the great

‘ connecting principle among all the
 ‘ various phenomena which we ob-
 ‘ serve. This, accordingly, was the
 ‘ conclusion which Malebranche de-
 ‘ duced from premises very nearly
 ‘ the same with Mr. Hume’s.’—*Elem.*
Phil. Hum. Mind., 2nd ed. note D.

EXTRACT FROM BERKELEY.

2. ‘ The order and course of
 ‘ things, and the experiments we
 ‘ daily make, shew there is a mind
 ‘ that governs and actuates this
 ‘ mundane system, as the proper
 ‘ real agent and cause. . . . We
 ‘ have no proof, either from experi-
 ‘ ment or reason, of any other agent
 ‘ or efficient cause than mind or
 ‘ spirit. When therefore we speak
 ‘ of corporeal agents or corporeal
 ‘ causes, this is to be understood in
 ‘ a different, subordinate, and im-
 ‘ proper sense.’—*Siris*, sect. 154,
 p. 70.

NOTE XIV.

(Referred to in § 19)

SYNOPSIS OF OPINIONS.

I.

WHAT is Causation really ?

<i>Hume</i> [<i>in his</i> <i>'Treatise'</i>] <i>Baden Powell</i> . [<i>with respect to</i> <i>physical causes</i>]	}	—Invariable suc- cession and no- thing more.
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Mill. — Unconditional invariable
sequence.

<i>Reid</i> <i>Beattie</i> <i>B. Powell</i> [<i>with</i> <i>respect to moral</i> <i>causes</i>] <i>Whewell</i> <i>Lewes</i> <i>Atkinson</i>	}	—Efficient Pro- duction.
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Sir W. Hamilton.—Transference of Substance.

Bain.—Transference of Force. .

Kant.—A relation or condition of things.

<i>Malebranche</i>	}	—An act of the Deity.
<i>Berkeley</i>		
<i>Stewart</i>		
<i>Leibnitz</i>		

<i>Hume</i> [in his	}	—The question is unanswerable. It is beyond the limits of our knowledge.
‘ <i>Inquiry</i> ’]		
<i>Brown</i>		
<i>Comte</i>		
<i>Mansel</i>		

2

Is there any necessary connection between Causes and Effects ?

<i>Reid</i>	}	—Yes.
<i>Beattie</i>		
<i>Leibnitz</i>		
<i>Kant</i>		
<i>Whewell</i>		
<i>Lewes</i>		
<i>Atkinson</i>		

<i>Malebranche</i>	}	— Yes, — if you allow that God is the cause of every change.
<i>Berkeley</i>		
<i>Stewart</i>		

<i>Hume</i> [<i>in the</i> <i>'Treatise'</i>]	}	—No.
<i>Hamilton</i>		

<i>Hume</i> [<i>in the</i> <i>'Inquiry'</i>]	}	—The subject is beyond the limits of our knowledge.
<i>Brown</i>		
<i>Comte</i>		
<i>Mill</i>		
<i>Mansel</i>		

3

Is Causation universal ?

<i>Reid</i>	}	—Yes.
<i>Beattie</i>		
<i>Kant</i>		
<i>Brown</i>		
<i>Whewell</i>		
<i>Mill</i>		

<i>Lewes</i>	}	—We have no means of knowing.
<i>Mansel</i>		

4

How is the idea of Causation in natural events produced in our minds?

Lewes.—By Experience.

<i>Reid</i>	}	—By Common Sense.
<i>Beattie</i>		

Hume.—By habit.

Hamilton.—By the impossibility of conceiving something coming from nothing.

<i>Kant</i>	}	—By Intuition.
<i>Whewell</i>		

<i>Locke</i>	}	—By analogy to our own volun- tary actions.
<i>Maine de Biran</i>		
<i>Mill</i>		
<i>Mansel</i>		

5

Is the belief in the universality of Causation a necessary truth (*i.e.* an a priori judgment)?

<i>Reid</i>	}	—Yes.
<i>Beattie</i>		
<i>Price</i>		
<i>Kant</i>		
<i>Brown</i>		
<i>Whewell</i>		
<i>Hobbes</i>	}	—No.
<i>Buckle</i>		
<i>Mill</i>		
<i>Lewes</i>		

NOTE XV.

(Referred to in § 8.)

KANT'S DOCTRINE.

1. Kant, 'could not contradict.
 ' the objections of Hume, . . .
 ' but he rather availed himself of
 ' them, suffered them to hold good,
 ' and took up, as perfectly well-
 ' grounded, the fundamental position
 ' of that sceptic, namely, that ex-
 ' perience teaches us nothing of

' causality and a necessary con-
 ' formity to law in nature. Of this
 ' position, however, he made a
 ' wholly different and unexpected
 ' use, since he discovered therein
 ' the negative confirmation of an
 ' ideal and subjective certainty. . . .
 ' Kant saw at once, that the most
 ' universal and highest conceptions
 ' must have an entirely different
 ' origin to the experience of the
 ' senses; that they were in them-
 ' selves, it is true, but empty forms,
 ' yet universally necessary in all
 ' thinking and cognition; and by
 ' this very criterion of universality
 ' and necessity, he believed that he
 ' had recognised them to be of a
 ' subjective character and resident
 ' *a priori* in the cognitive faculty of
 ' man.' — CHALYBAUS: *Spec. Phil.*
 (Tulk's trans.) Lect. ii.

2. ' According to Kant, causality
 ' is an inseparable condition of our
 ' experience: a connexion in events
 ' is requisite to our apprehending
 ' them as events. . . . We cannot
 ' fix the mind upon occurrences,

‘ without including these occurrences
‘ in a series of causes and effects.
‘ The relation of causation is a
‘ condition under which we think of
‘ events, as relations of space are a
‘ condition under which we see
‘ objects.’—WHEWELL: *Hist. Scien.*
Ideas, b. iii. ch. iii. art 3.

3. ‘ According to Kant we have
‘ the idea of cause, and also the
‘ belief that every commencing phe-
‘ nomenon implies the operation of
‘ a cause. But these are merely forms
‘ of our understanding, subjective
‘ conditions of human thought. In
‘ conformity with a pre-existing law
‘ of our intelligence, we arrange
‘ phenomena according to the rela-
‘ tion of cause and effect. But we
‘ know not whether, independently
‘ of our form of thought, there be
‘ any reality corresponding to our
‘ idea of cause, or of productive
‘ power.’—FLEMING: *Vocab. Phil.*
sec. ed. p. 80 (art. on Causality).

CHAPTER III.

THE PROBLEM SOLVED.

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THE PROBLEM SOLVED.

1. After reading the conflicting opinions exhibited in the foregoing chapter, one feels inclined to throw up the whole inquiry in despair as a hopeless and inextricable puzzle. Or, at any rate, to ask whether the dispute really is concerning matters of fact—whether it be not, after all, merely an affair of definition. The word ‘cause’ and its derivatives exist in the language—they convey ideas to the mind—and, in the

affairs of common life, are understood by everybody ;—why, then (it may be asked), should metaphysicians by their subtleties create such unnecessary confusion? Why should they throw obscurity over the meanings of terms which previously were clear and intelligible?

2. This question is natural though superficial. Philosophers are quite willing to let words retain their popular significations, provided they are not obtruded into topics for which they are unfitted. There are many words harmless enough when confined within the limits of commonplaces ; but let them be used in the discussion of subjects in the slightest degree speculative, and the most dire confusion is the result.

3. This is peculiarly the case with regard to the words ‘cause,’ &c.

Ordinarily they are sufficient for the ideas to be conveyed : employed about commonplaces they are never misunderstood. But when we see them occurring in speculations demanding the utmost precision of language, where the least ambiguity is fatal—when we find them employed, now to demonstrate the existence of a Deity—now to enforce the necessity of atheism ; when we see them used alike in arguments for freewill and in reasonings for fatalism—it is obvious that a closer scrutiny into the ideas they represent is rendered imperative. It may be that the popular notion of a cause is altogether inapplicable to these speculations. It may be that the use of the undefined word in such discussions is productive of nothing but confusion and

error. Our first step in this inquiry, then, will evidently be to ascertain the signification that the word 'cause' bears in common parlance; —the meaning which people have; when they speak of one thing 'causing' another.

4. What says Dr. Johnson? According to him '*to cause*' is '*to effect, to produce*'—and '*a cause*,' '*that which produces or effects anything.*' Nine persons out of ten would give the same definitions, if suddenly asked. But properly they are not definitions at all—merely synonymes. To 'cause' and to 'produce' or 'effect' are convertible terms, and to give one as an explanation of the other is, to use Hume's phrase, '*to run in a circle.*'*

5. Is Hume's definition of 'in-

* See *ante*, T. 34.

variable sequence' a better one? No; for two reasons. First, as Reid pointed out, many invariable successions are not causation. And secondly, some cases of causation do not involve sequence at all; cause and effect often appearing to be simultaneous or contemporaneous.

6. Mr. Mill allows both these objections to Hume's definition, and seeks an amendment by, on the one hand, introducing the word unconditional,* and, on the other, by dropping the words antecedent and consequent. 'I have no objection,' he says; 'to define a cause, the assemblage of phenomena, which occurring, some other phenomenon invariably [and unconditionally] commences, or has its origin.'†

* *System of Logic*, b. iii. chap. v. § 5.

† *Ib.* § 6.

Now, this is more a description of certain facts relating to causality than a definition. Every assemblage of phenomena which occurring, some other phenomenon invariably and unconditionally commences, may as a matter-of-fact be a cause. As a matter-of-fact every one-horned quadruped may be a rhinoceros ; but no one would think of giving ' a one-horned quadruped ' as a definition of that animal.

7. Such is the objection to Mr. Mill's definition when criticised literally, or according to the bare meaning of its terms. But if judged in regard to what is *implied* (or rather, what would be tacitly added by the generality of persons), the objection would be the same as that to Johnson's definition. The word *occurring* may be interpreted as

merely a participle of time (*e.g.* 'when it may happen to occur'): this is the bare or literal meaning. Or it may be interpreted with the implied addition of the causal-idea, which is the very notion to be defined: *e.g.* 'the storm occurring, the people grew frightened' implies the production of one event by the other, in addition to their relation in time. And thus we return to the synonymes from which we started.

8. Is there no escape from this metaphysical whirlpool of synonymous terms? Must we always be swept back into it? The words which Hume gives as convertible, or nearly so, with causality are—*efficacy, agency, power, force, energy, necessity, connection, and productive quality*. All of these, except 'necessity' and 'connection,' we can pass

by ; for they imply some power of a cause over an effect—exactly what we are wishing to analyse. ‘Connection’ we can also pass by—being simply relation—a notion too wide for our purpose. The remaining word, namely, ‘necessity,’ may perhaps be the key to the difficulty.

9. It is admitted now by all that, whether there be or be not an objective necessity connecting causes and effects, it is at all events perfectly imperceptible. Between events no necessary connection can be perceived. Yet, nevertheless, the prevailing belief is, that there *is* such a necessity in every case of causation. Over and above the idea that ‘an effect unconditionally and invariably accompanies its cause is the notion that it *MUST* do so—that it is

OBLIGED to do so. Whenever their connection is thought to be contingent, events are not called cause and effect; their conjunction is then styled 'merely a coincidence.' Hence the idea of *necessity* is an essential portion—a *sine qua non*—of the causal notion.

10. Now, as necessity cannot be perceived in phenomena, it is plain that the idea cannot have originated from the contemplation of physical events. Every one must have an idea of '*must*' altogether apart from phenomena before he can attribute it to them. The idea is an intellectual one; and the more civilised (*i.e.* educated) a nation, the stronger is its grasp on the notion. Some savage races seem scarcely to possess the idea at all; to them everything

appears the result of chance.* They have not had the primary mental idea of necessity developed, and consequently have it not to attribute to external events.

11. This primary mental idea of necessity which must be developed before the notion of causality can arise, is what is called by metaphysicians 'logical necessity.' It is a perception of what Professor Bain calls the 'Law of Consistency.'† It is seen that certain things *must* accompany certain other things; otherwise there would be involved an inconsistency or contradiction. There cannot be hills without valleys; if the premisses of a syllogism are true, the conclusion must also be true; two straight lines can-

* See Note xvi. † See Note xvii.

not enclose a space ; and so on. With the perception of the absoluteness and unconditionalness of such truths, dawns on the mind the idea of necessity, the notion of a ' must.' This once possessed, its transference to phenomena is easy.

12. The problem for us is to find what truth there is in the prevalent belief concerning causation : are we justified in transferring the attribute of necessity from axioms and demonstrated propositions to the relation between natural events ? Hume, in his *Treatise of Human Nature*, as we have seen, maintained that we are not ; that we believe in necessary connection by an illogical process of inference ; that, in fine, we are so used to witness certain combinations of phenomena that habit induces the conviction of certainty.

13. There is much truth in this theory; and, consequently, it has numerous supporters. We shall presently see, however, that it is only a half-truth. It gives, as it were, one side of the medal; but there is another side which needs to be supplied before the whole of the truth can be seen. Of that anon. In the meanwhile the importance of Hume's half-truth must be insisted on.

14. If we divest ourselves of our acquired knowledge and beliefs, and imagine ourselves observing for the first time any succession or correlation of events, we shall see that there is nothing in them or their conjunction to tell us of power or necessity. It is only by witnessing the same combination of phenomena several times, that we get the idea

of invariability, and thence that of necessity.

15. For example, the phenomena of gravitation are so common and we are so used to them that we attribute a necessity to them. But if we had never before seen a body fall, there would be nothing in the descent of the first thing we saw fall to point to any necessity. For all we could know to the contrary, the objects might just as well have remained motionless, or have gone in any other direction than downwards.

16. Take any other case at random amongst phenomena; and it will be the same. We do not know the efficient cause of anything. We only know secondary or conditional causes, which properly speaking are not efficient causes at all. Scientific

men are aware of this, and speak now of the 'conditions' of phenomena rather than of their 'causes.' For example : The insertion of zinc and copper, connected together in a certain manner, in diluted sulphuric acid (hydric sulphate), is called one of the causes or conditions of the production of the electricity, &c. But what right have we to assert that there is any necessary connection between the one and the other ? None. In short we only know conditions. We do not know the wherefore of anything. The 'explanations' of phenomena, if made in order to assign the causes, are nothing but solemn scientific babble to cover our ignorance ; but if made merely to inform us of the conditions or circumstances or uniformities which attend phenomena,

they are useful so far, and serve to establish 'laws' or 'rules.'*

17. There is a widespread misconception concerning the 'laws' of nature. They are spoken of as if they possessed power or force. One often hears a child's question, 'Why do things fall?' answered by—'Because of the law of gravitation;' as if the law of gravitation, instead of being a mere generalization from the facts to be explained, were a different thing altogether, a force of some kind. This is surely 'putting the cart before the horse.' It is equivalent to the following: 'Why did Mr. Smith die? Because of the law of mortality.' The true answer to a child who asks why things fall to the ground, is this: 'No one knows. But it is an ob-

* See Note xix.

served fact that under certain circumstances all bodies *do* fall.' Mr. Lewes has well exposed the meaninglessness of such explanations as 'Animals live because of their vitality,' 'Watches go because of their watch-force,' 'Things fall because of their falling force' (*i.e.* 'gravitation'). Mr. Mill, too, in his "System of Logic," has explained the true nature of 'law.' Professor Bain and several other writers take the same position; and the Duke of Argyll gives an analysis of law which virtually amounts to the same view.*

18. In short, 'law' is merely the name we give to generalizations—or, in logical language, to universal propositions which we believe to be true. 'This man is mortal' is a

* See Note xx. See also *ante*, Note. xii.

‘particular’ proposition, and therefore no law; ‘all men are mortal,’ a universal proposition, is a law, a law of human nature. ‘It is raining’ is particular; ‘it always rains on Sundays’ is universal, and would, if true, be a law.

19. Thus, law, *as law*, does not involve necessity, whatever the popular opinion on the point may be. Order or uniformity may be *conceived* happening by chance; and wherever there is uniformity there is that which may be expressed by a universal proposition—namely law.

20. There is, however, a necessity *flowing from* a law—the necessity of implication or consistency—the necessity that if a law is true every instance coming under or included in it must be in agreement with it.

This is merely logical necessity—the necessity which connects the conclusion of a syllogism to the premisses.

Thus,

All men are mortal ;
Dion is a man ;
Dion is mortal,

is an example of the simplest possible syllogism. Alter the arrangement a little, but preserve the reasoning,—

All men are mortal ; [*Law*]

Dion (being a man) is mortal, [*Instance*]

and the identity will be at once seen.

21. Or, the necessity might be called '*conditional necessity*.' In explanations of phenomena, the law frequently is not known for certain, but is assumed as a supposition likely to be the right and proper one. If, for example, it is not known for certain that all men are mortal,—

If all men are mortal, [*Theory* or
Hypothesis]

Dion (being a man) is mortal [*Fact*
explained]

shows that the necessity is conditional.

22. In fine this logical or conditional necessity is the necessity by which Cause and Effect are connected in our minds. If a law is true, every instance under it is necessarily in accordance with it. If the law of human nature, that all men are mortal, is true, it necessarily follows that you, he, and I are all and each of us mortal. If the law of gravitation, that all bodies approach when there is nothing to prevent them from doing so, is true, it necessarily follows that this stone will fall to the earth unless something prevent. And so with all other instances of causation. The necessity in every

one of them is a logical or conditional necessity.

23. The identity might be still further exhibited by a few comparisons. In logic the conclusion, in the simplest syllogism, is true because the major premiss is universal, because the middle term is 'distributed'. Similarly, in physical science the (so-called) effect takes place because the law under which it comes is universal. In logic, again, the conclusion is said to be contained in the premisses. In physical science, in the same way, all effects are contained in their so-called causes. By logic alone we cannot arrive at *really* new truths. We can merely unfold, what, were we keen-sighted enough, we could arrive at by intuition, immediately on the statement of the first prin-

ciples. So, in physical science. Not a single so-called 'explanation' of phenomena does more than show that the phenomena are implied in the theories put forward.

24. In short, the inferring of effects from laws, or of laws from phenomena, bears a close resemblance to the working out of an equation in algebra—the steps of which process are connected together by the necessity of implication or consistency. Laws and phenomena, causes and effects, are bound together, in our minds, by precisely the same subjective necessity.* Nor can we imagine any other sort of necessity. We have never had experience of any otherkind, and there-

* See Note xxi.

fore can no more conceive of such than a man born blind can have ideas of colour.

25. This at first sight seems paradoxical. The popular idea of a compulsion or necessity binding together causes and effects does not immediately appear to be resolvable into one of a mere 'subjective necessity. To this it may be replied that the *popular* idea is not always the *correct* idea. A true and scientific analysis of causation ought to consist rather of an exhibition of what the idea *should be* than of what it actually is.

26. It is quite obvious that the idea of necessary connection cannot be innate or intuitive. Whatever we believe about phenomena is based upon the *observation* of phenomena.

The idea of causation arises in our minds upon witnessing the uniformity, &c., prevailing. If we had been born into a world of perfect chaos, we could never have believed in causation or in necessary connection.

27. The simplest idea of causation, and probably the first arising in the mind, is that of mere invariability of conjunction. We observe certain events so often associated with certain others, that we get to imagine a necessity of some sort (never clearly defined) as the bond of union. This is the crudest form of the idea, and the one, too, which is the easiest to be overcome. The more mysterious the necessity the more easily is it disbelieved in. In such cases the transition from causation to 'mere coincidence,' or *vice*

versa, is more readily made by the mind than in other instances.

28. For example, friction is said to cause heat.* In this case, we have simply one event (the rubbing together of two substances), followed by another (the evolution of heat); and the involved idea of necessity or causation is based merely on the observation of such sequence. The notion of necessity here is so far from being deeply rooted in our minds, that very little would be needed to dissipate it. One well-authenticated case of friction being followed by *cold* would be quite sufficient for that purpose.

29. A similar instance of the idea

* Example given by Powell: *Nat. and Div. Truth*, p. 88.

occurs in the proposition, 'Heat causes expansion.' The notion of necessity here, is (among men of science, at least) even fainter than in the former example; for in the case of water between 32° and 40° Fahr. in temperature, heat is accompanied by *contraction*.

30. The truth is, that in such instances of reputed causation, physicists would guard themselves by saying that the alleged cause is not properly the cause, but *only part thereof*. That the real cause is the sum of all the necessary antecedents. Thus friction is only one of the necessary antecedents of the heat evolved, and therefore merely a part of the cause. The same with heat being followed by expansion or contraction. The heat is only part of the cause. If we knew the other

parts (*i.e.* the other necessary antecedents), we should understand why heat is accompanied by expansion at one time and by contraction at another.

31. At this point the idea of causation enters a higher phase. The original popular notion of one cause to one effect passes into the correcter and more scientific theory of every effect being the result of many causes. This may be considered the view now generally prevalent among men of science. Indeed the word cause at this stage of progress generally disappears altogether. The term is apt to be misunderstood (it is argued); it is so greatly associated with metaphysical and theological speculations, that ideas entirely irrelevant, and sometimes mischievous, are imported into the calm stream

of scientific investigation. Hence, men of science as a rule now prefer the term 'conditions' instead of 'causes.' Friction is called a condition or one of the conditions of heat, instead of a cause or one of the causes thereof.

32. We will not stop to inquire whether the new term is not just as misleading in one way as the old word was in another. There are materialists or positivists whose use of the term condition fitly expresses their entire adherence to the theory of Hume (as given in the *Treatise of Human Nature*), that there is no necessary connection between events—merely relation, co-incidence, sequence, &c. But in such cases the idea of causation (as usually understood) entirely disappears ;

hence further consideration hereof is beyond the limits of this inquiry. We must analyze the notion of causality whilst that of necessity still forms an essential part of it.

33. The idea of an event being the effect of more causes than one, bears an analogy to two or three other notions. For example, in *mechanics*, to a force being the resultant of various components; and, in *logic*, to a proposition being the conclusion from various premisses. But the point which, as it seems to me, should be impressed above everything, is the similarity to logic: in other words, that, when pushed to a last analysis, we can discover nothing in the necessity between causes or effects besides a subjective or logical necessity—the necessity

of consistency or implication. We cannot even imagine any other kind. There is a latent feeling in our minds, on contemplating the operations of nature, that if we only knew *all* the essential conditions or causes of a phenomenon we should be able to see the connection—the *necessity* of the connection—as clearly as we see the connection between the premisses and the conclusion of a syllogism.

34. Besides this, the necessity is also *conditional*. That is to say, it depends on the assumption of the universality which we attribute to the laws, principles, theories or hypotheses which we lay down in order to explain phenomena. No one can tell absolutely that a law is universal; but on the assumption of such universality, the occurrence

of certain phenomena is explained by implication.

35. We cannot for certain (*e.g.*) tell that the law of gravitation is universal. We cannot absolutely know that all the bodies in the universe, without a single exception, are attracted towards each other. But assuming that it is so by way of hypothesis, astronomical and terrestrial phenomena are explained or deduced, just as a conclusion is drawn from premisses. The necessity connecting the cause and the effect is logical and at the same time conditional. Here we see the application of what has already been hinted at.* When it is said that gravitation is the cause of the attrac-

* See *ante*, § 21.

tion between the earth and the moon, all that is meant is that one is a case or instance of the other ; thus,

(If) all material bodies attract each other ; [*Law of gravitation*]

(Then) the earth and moon (being material bodies) attract each other. [*Phenomenon*]

36. The same thing may be seen in all other instances into which the idea of causality enters ; and perhaps in a greater degree. The explaining of the fall of bodies by pointing to the law of gravitation is so extremely simple, that every one sees its nature directly. And for that reason it is, *by itself*, scarcely an instance of the idea of causation. The more complicated the combination of laws (or premisses) the more hidden is the true nature of the necessity ; and, by a curious fallacy of the mind,

the stronger the idea of an *unconditional* necessary connection becomes. When an effect is an instance merely of a single law, it is thought not so certain as when many laws form the premisses. That God should cause an event to happen contrary to one law, would be thought a slight miracle in comparison with the alteration of an event dependent on a combination of several laws.*

37. For this reason the true idea of causality is perhaps better exhibited by taking examples from more complicated cases. We have seen that gravitation simply in itself; friction causing heat; and such phenomena—are *empiric* as far as their *raison d'être* is concerned. We do

* See Note xxii.

not know *why* material bodies should attract each other, or *why* friction should be accompanied by heat. And therefore we have little, if any, conviction of necessity in relation to these cases. If on the other hand they could be referred to wider laws, our notion of necessity would be greater; if these again could be referred to still wider, our impression of the necessity would be still stronger; and so on.

38. Although we have not any explanations of gravitation, friction causing heat, &c., we have nevertheless the conviction of a conditional necessity regarding them. If we only knew *all* the circumstances the explanation would be complete. This we feel certain of. But to the unphilosophical mind, an explanation wanting, is equivalent to mystery.

It is for men of science to recognise that, as far as explanations go, all phenomena and all laws are on an absolute equality—none higher and none less; and the necessity the same in all cases. That is, of course, viewing them subjectively; in their relation to ourselves. What their relative importance may be intrinsically and absolutely we have not the slightest knowledge.

39. At first all observations are empirical. After a time, in the progress of discovery, a phenomenon is found to bear a similarity to other phenomena; and they are all classed together. This is the first step in 'explanation.' Further on, and the whole species is found to agree with another species. This is considered a still more satisfactory explanation; and after a time perhaps

the whole genus is found to accord with another genus; and so on. Every new discovery of similarity gives additional satisfaction to the mind in its search after uniformity.

40. Baden Powell gives a good illustration of this.* ‘When the
‘ suspension of water in the pump
‘ was first observed it was ascribed
‘ to a cause called *suction*, and in the
‘ then state of knowledge, it was not
‘ only natural, but inductively cor-
‘ rect, to ascribe so singular an effect
‘ to a peculiar cause. It was appa-
‘ rently a case *sui generis*. The effect
‘ was, perhaps, soon seen to be of
‘ the same kind as the suspension
‘ of a stone by contact with the under
‘ side of a wet leather; there was

* *Nat. and Div. Truth*, p. 90.

‘ then one step taken in the process
‘ of generalization, by referring both
‘ to one common cause, still named
‘ suction. Further, the discovery
‘ of Torricelli referred the former
‘ case to the pressure of the atmo-
‘ sphere ; and this was soon seen to
‘ include the explanation of the latter
‘ and all other analogous phenomena.
‘ And, finally, this was reduced under
‘ the still more comprehensive law
‘ of universal gravitation.’

41. Much confusion of thought is occasioned by the use of abstract nouns ; and it would add greatly to scientific exactness were they all banished, and equivalent phrases used instead. Gravitation, suction, life, inherent principle, property, vitality, power, will, and countless other things, have at one time been,

or still are, regarded as causes. Such explanations of phenomena really explain nothing. They are merely cloaks to cover our ignorance. Just think of it. Gravitation the cause of things gravitating. Suction the cause of sucking. Will the cause of volition. Do not such explanations, when divested of sophistical padding, dwindle down to these barren and absurd propositions? Mr. Lewes has some excellent remarks on this head. We might as well, he says, attribute the cause of a watch going to its 'watch force.' *

42. Now, were all these abstract nouns translated into their (so to speak) concrete equivalents, their nature would appear in its true light. It

* 'Aristotle,' chap. iv. § 72 b.

would be seen that we know nothing of these things except empirically. That we know nothing of gravitation except that, as a matter of fact, material bodies gravitate. That we know nothing of life, except that living beings live. Of anything else we are profoundly ignorant. The more we learn of nature, the more we see there is to be known, and the more we become acquainted with our own ignorance.

43. We shall see the real nature of the 'explanation' of phenomena in the instance already given of the raising of water by a pump. In the first place that phenomenon was attributed to 'suction'; which was merely a way of saying that it was a case of a liquid being sucked up or raised. The rise of a liquid through a straw to the mouth was a

phenomenon of the same species. Saying, therefore, that 'suction' was a *cause*, only explained the event by a logical necessity. Thus—

(If) under certain circumstances liquids rise [*Major premiss*]

(Then,) the action of a pump involving such circumstances ; and water being a liquid ; [*Minor premisses*]

(It follows that) upon the action of a pump, the water rises. [*Conclusion*]

The explanation of the rise of the water by the maxim, 'Nature abhors a vacuum,' was similarly merely a logical deduction :—

(If) Nature always provides against the possibility of a vacuum ; [*Major*]

(Then) the way of providing against the existence of a vacuum in a pump, being the rise of the water, [*Minor*]

(It follows that) the water rises in a pump. [*Conclusion*]

44. The second step was made on the discovery that water could not be raised by a pump, as a rule, to a greater height than 32 or 33 feet, sometimes not higher than 31 feet, and very seldom above 34 feet. This showed the falsity of the hypothesis (or major premiss) that vacua do not exist in nature. The philosophers of the period had accordingly to search for another explanation (*i.e.* find another '*middle term*'). Galileo's solution of the difficulty, namely, that nature abhorred a vacuum *only to the extent of 33 feet*, did not altogether sound satisfactory; and Torricelli was set thinking and experimenting to find out a more likely '*middle term*.' This at length was found; and the whole species, *suctiones*, was seen to belong to the genus *equilibria*. Phenomena

of equilibrium, in their turn, are deducible from still wider laws or hypotheses in mechanics ;—to speak logically, they are deducible from more general major-premisses ;—to speak the language of naturalists, they belong to still higher *genera*.

45. And so with all other phenomena. Every so-called effect is explained by showing its inference from some law or hypothesis. And many hypotheses are, in their turn, referable, in the same manner, to wider generalizations or *genera*.* The further this process can go, the greater is the satisfaction to our minds—the firmer is our idea of the stability and invariableness of the phenomenon. This is the true ‘necessary connection’ between

* See Note xxii. § 2.

cause and effect. It is logical necessity—the necessity of implication. Of any other kind of necessity we have no knowledge, and, indeed, not the slightest conception. We can only imagine what we have experienced; and the analysis of causality has shown that the necessity we attribute to events is altogether subjective—the development of logical consistency and of nothing else.

46. In conclusion, there is one important corollary to be mentioned which cannot be too strongly impressed on all—scientific and unscientific alike. It is the ‘conditionalness,’ or ‘hypotheticalness,’ of all laws. We arrive at these ‘major premisses’ by generalization; and, as none of us are omniscient,

it follows that we never know absolutely the truth of a single law of the inductive sciences. The importance of knowing this little fact can scarcely be overrated. In these days of much superficial-cramming of scientific facts and theories, there is constantly a danger, unless the science be accompanied with philosophy, of our getting false ideas of what is possible or impossible—and a tendency to dogmatise when we have least reason for doing so. A deep feeling on our part that all our science* is really nothing but a collection and classification of isolated but analogous facts—and that anything beyond this is outside the

* i.e. *inductive* science. I do not, of course, include the mathematical or the sciences of the *unconditioned*.

limits of our knowledge (at least as those limits at present are)—ought to teach us how emphatically superficial even our deepest discoveries are, and how infinitesimal is our knowledge of the marvellous secrets and vast resources of nature.

APPENDIX TO CHAPTER III.

NOTES XVI. TO XXII.

APPENDIX TO CHAPTER III.

NOTE XVI.

(Referred to in § 10.)

ORIGIN OF BELIEF IN CAUSES.

‘ There are two doctrines, which
‘ appear to represent different stages
‘ of civilization.

‘ According to the first doctrine,
‘ every event is single and isolated,
‘ and is merely considered as the
‘ result of a blind chance. This
‘ opinion, which is most natural to
‘ a perfectly ignorant people, would
‘ soon be weakened by that extension of experience which supplies
‘ a knowledge of those uniformities
‘ of succession and of co-existence
‘ that nature constantly presents.

‘ If, for example, wandering tribes,
‘ without the least tincture of civilization, lived entirely by hunting

‘ and fishing, they might well sup-
 ‘ pose that the appearance of their
 ‘ necessary food was the result of
 ‘ some accident which admitted of
 ‘ no explanation. The irregularity
 ‘ of the supply, and the apparent
 ‘ caprice with which it was some-
 ‘ times abundant and sometimes
 ‘ scanty, would prevent them from
 ‘ suspecting anything like method
 ‘ in the arrangements of nature ;
 ‘ nor could their minds even con-
 ‘ ceive the existence of those general
 ‘ principles which govern the order
 ‘ of events, and by a knowledge of
 ‘ which we are often able to predict
 ‘ their future course.

‘ But when such tribes advance
 ‘ into the agricultural state, they,
 ‘ for the first time, use a food of
 ‘ which not only the appearance,
 ‘ but the very existence, seems to
 ‘ be the result of their own act.
 ‘ What they sow, that likewise do
 ‘ they reap. The provision neces-
 ‘ sary for their wants is brought
 ‘ more immediately under their own
 ‘ control, and is more palpably the
 ‘ consequence of their own labour.

‘ They perceive a distinct plan, and
‘ a regular uniformity of sequence,
‘ in the relation which the seed they
‘ put into the ground bears to the
‘ corn when arrived at maturity.
‘ They are now able to look to the
‘ future, not indeed with certainty,
‘ but with a confidence infinitely
‘ greater than they could have felt
‘ in their former and more precarious
‘ pursuits. Hence there arises a dim
‘ idea of the stability of events ; and
‘ for the first time there begins to
‘ dawn upon the mind a faint con-
‘ ception of what at a later period
‘ are called the Laws of Nature.

‘ Every step in the great progress
‘ will make their view of this more
‘ clear. As their observations ac-
‘ cumulate, and as their experience
‘ extends over a wider surface, they
‘ meet with uniformities that they
‘ had never suspected to exist, and
‘ the discovery of which weakens
‘ that doctrine of chance with which
‘ they had originally set out.

‘ Yet a little further, and a taste
‘ for abstract reasoning springs up ;
‘ and then some among them gene-

‘ realize the observations that have
 ‘ been made, and, despising the old
 ‘ popular opinion, believe that every
 ‘ event is linked to its antecedent
 ‘ by an inevitable connexion ; that
 ‘ such antecedent is connected with
 ‘ a preceding fact ; and that thus
 ‘ the whole world forms a necessary
 ‘ chain, in which indeed each man
 ‘ may play his part, but can by no
 ‘ means determine what that part
 ‘ shall be.

‘ Thus it is that, in the ordinary
 ‘ march of society, an increasing per-
 ‘ ception of the regularity of nature
 ‘ destroys the doctrine of Chance,
 ‘ and replaces it by that of Necessary
 ‘ Connexion.’—BUCKLE.*

* *History of Civilization*, 3rd ed. vol. i.
 pp. 8—9.

NOTE XVII.

(Referred to in § 11.)

THE LAW OF CONSISTENCY.

‘ It is a fundamental requisite of
 ‘ reasoning, as well as of communi-
 ‘ cation by speech, that what is
 ‘ affirmed in one form of words shall
 ‘ be affirmed in another.

‘ Language often contains equi-
 ‘ valent expressions for the same
 ‘ fact. There are synonymous names
 ‘ as “round,” “circular”; a round
 ‘ thing is the same as a circular
 ‘ thing. “Matter is heavy,” “matter
 ‘ gravitates,” are the same fact in
 ‘ different words; if the one is true,
 ‘ so is the other, by virtue of mere
 ‘ consistency. . . .

‘ “ All matter is heavy, therefore
 ‘ any one piece of matter is heavy,”
 ‘ is called a *necessary* inference. A
 ‘ more exact designation would be

‘ an *equivalent, implicated, or self-consistent* assertion.’—BAIN.*

‘ In common speech, “necessity” is a synonym of certainty; and would apply to *inductive* truths. . .

‘ “Necessity” more properly means *implication*; “necessary truths” in this sense are the truths demanded by Consistency. Their denial is a contradiction in terms. . . .

‘ A third meaning and criterion of Necessity, is *inconceivability of the opposite*.’—BAIN.†

* *Logic*, Introd., art 21.

† *Logic*, b. ii. chap. v. arts. 3—6. See also the following Note. ~~63~~

NOTE XVIII.

(Referred to in Note xvii.)

MEANING OF NECESSITY.

‘ NECESSITY (*ne* and *cesso*, that
 ‘ which cannot cease).—I have one
 ‘ thing to observe of the several
 ‘ kinds of *necessity*, that the idea of
 ‘ some sort of firm connection runs
 ‘ through them all:—and that is the
 ‘ proper general import of the name.
 ‘ Connection of mental or verbal
 ‘ propositions, or of their respective
 ‘ parts, makes up the idea of “logi-
 ‘ cal” necessity,—connection of end
 ‘ and means makes up the idea of
 ‘ “moral” necessity,—connection of
 ‘ causes and effects is “physical”
 ‘ necessity,—and connection of ex-
 ‘ istence and essence is “metaphy-
 ‘ sical” necessity.’—WATERLAND.*

* *Works*, vol. iv. p. 432. Quoted by Dr. Fleming, *Vocab. Phil.* 2nd ed. p. 342.

‘ If necessity do concern things
 ‘ in themselves, necessity is yet no
 ‘ predicate of a thing, any farther
 ‘ than it expresses a certain quality
 ‘ of our conceptions regarding the
 ‘ existence of the thing. In fine,
 ‘ necessity lies not so much in the
 ‘ objective reality as in the subjective
 ‘ mind.

‘ To illustrate this doctrine by an
 ‘ example taken from the science of
 ‘ magnitude. That the three interior
 ‘ angles of every triangle are equal
 ‘ to two right angles, is a truth
 ‘ which, if the demonstration has
 ‘ been followed, cannot but be be-
 ‘ lieved, when the subject is thought
 ‘ on. It is therefore pronounced
 ‘ a necessary truth.’—W. H. GIL-
 LESPIE.*

‘ Most persons are familiar with
 ‘ the distinction of *necessary* and *con-*
 ‘ *tingent* truths. The former kind
 ‘ are truths which cannot but be
 ‘ true ; as that 19 and 11 are 30 ;—

* *Exam. of Antitheos*, part i. §§ 64—65.

‘ that parallelograms upon the same
 ‘ base and between the same parallels
 ‘ are equal ;—that all the angles in
 ‘ the same segment of a circle are
 ‘ equal. The latter are truths which
 ‘ *it happens* (*contingit*) are true ; but
 ‘ which, for anything which we can
 ‘ see, might have been otherwise.’
 —WHEWELL.*

NOTE XIX.

(Referred to in § 16.)

EXTRACT FROM HAMILTON.

‘ When a fact is generalized, our
 ‘ discontent is quieted, and we con-
 ‘ sider the generality itself as tan-
 ‘ tamount to an explanation. Why
 ‘ does this apple fall to the ground ?
 ‘ Because all bodies gravitate to-
 ‘ wards each other. Arrived at this
 ‘ general fact, we inquire no more,

* *Hist. Scien. Ideas*, part i. b. i. chap. i. § 2.

‘ although ignorant now as previously of the cause of gravitation ;
 ‘ for gravitation is nothing more
 ‘ than a name for a general fact, the
 ‘ “ why ” of which we know not.’—
Lectures, i. p. 71.

NOTE XX.

(Referred to in § 17.)

MEANING OF ‘ LAW

1. ‘ The word Law expresses the
 ‘ constant and regular order accord-
 ‘ ing to which an energy or agent
 ‘ operates.’—FLEMING : *Vocab. Phil.*
 p. 286.

2. ‘ It is a perversion of language
 ‘ to assign any law, as the efficient,
 ‘ operative cause of anything. A
 ‘ law presupposes an agent ; for it is
 ‘ only the mode, according to which
 ‘ an agent proceeds : it implies a
 ‘ power ; for it is the order, accord-
 ‘ ing to which that power acts.

‘ Without this agent, without this power, which are both distinct from itself, the law does nothing, is nothing.’—PALEY : *Nat. Theol.*, ch. i. § 7.

3. ‘ Those who go about to attribute the origination of mankind (or any other effect) to a bare order or law of nature, as the primitive effecter thereof, speak that which is perfectly irrational and unintelligible ; for although a law or rule is the method and order by which an intelligent being may act, yet a law or rule or order is a dead, unactive, uneffective thing of itself.’—HALE : *Prim. Orig.*, ch. vii. § 4.*

4. ‘ The first point to be noted in regard to what is called the uniformity of the course of nature, is, that it is itself a complex fact, compounded of all the separate uniformities which exist in respect

* Quoted by Dr. Fleming : *Vocab. Phil.*, p. 286.

‘ to single phenomena. These various uniformities, when ascertained by what is regarded as a sufficient induction, we call in common parlance, Laws of Nature.’—MILL : *System of Logic*, b. iii. ch. iv. § 1.

5. ‘ The problem of Inductive Logic may be summed up in two questions : how to ascertain the laws of nature ; and how, after having ascertained them, to follow them into their results. On the other hand, we must not suffer ourselves to imagine that this mode of statement amounts to a real analysis, or to anything but a mere verbal transformation of the problem ; for the expression, Laws of Nature, *means* nothing but the uniformities which exist among natural phenomena, when reduced to their simplest expression.’—MILL : *ib.*

..

6. ‘ If the explaining a phenomenon be to assign its proper efficient and final cause, it should seem the mechanical philosophers never explained anything ; their

‘ province being only to discover the
 ‘ laws of nature, that is, the general
 ‘ rules and methods of motion, and
 ‘ to account for particular phænomena by reducing them under, or
 ‘ shewing their conformity to such
 ‘ general rules.’—BERKELEY, *Siris*,
 § 231.

7. ‘ It may be that some proud and
 ‘ rash generalisation of the schools
 ‘ is having its falsehood proved by
 ‘ the violence it does to the deepest
 ‘ instincts of our spiritual nature. . .
 ‘ Such, for example, is the conclusion
 ‘ to which the language of
 ‘ some scientific men is evidently
 ‘ pointing, that great general Laws
 ‘ inexorable in their operation, and
 ‘ causes in endless chain of invariable
 ‘ sequence, are the governing
 ‘ powers in Nature, and they leave
 ‘ no room for any special direction
 ‘ or providential ordering of events.
 ‘ If this be true, it is vain to deny
 ‘ its bearing on religion. What,
 ‘ then, can be the use of prayer?
 ‘ Can Laws hear us?

‘ The conception of Natural Laws,

‘ which involves us in such ques-
 ‘ tions, and points to such con-
 ‘ clusions, demands surely a very
 ‘ careful examination at our
 ‘ hands.

‘ What, then, is this reign of
 ‘ Law? What is Law, and in what
 ‘ sense can it be said to reign?

‘ Words, which should be the
 ‘ servants of thought, are too often
 ‘ its masters; and there are very
 ‘ few words which are used more
 ‘ ambiguously, and therefore more
 ‘ injuriously, than the word Law. . . .
 ‘ There are at least five different
 ‘ senses in which Law is habitually
 ‘ used, and these must be carefully
 ‘ distinguished:—

‘ First, We have Law as applied
 ‘ simply to an observed order of
 ‘ facts.

‘ Secondly, To that order as in-
 ‘ volving the action of some force or
 ‘ forces, of which nothing more may
 ‘ be known.

‘ Thirdly, As applied to individual
 ‘ forces the measure of whose opera-
 ‘ tion has been more or less defined
 ‘ or ascertained.

‘ Fourthly, As applied to those
 ‘ combinations of force which have
 ‘ reference to the fulfilment of pur-
 ‘ pose, or the discharge of function.

‘ Fifthly, As applied to abstract
 ‘ conceptions of the mind—not
 ‘ corresponding with any actual phe-
 ‘ nomena, but deduced therefrom
 ‘ as axioms of thought necessary
 ‘ to our understanding of them.’—
 DUKE OF ARGYLL: *Reign of Law*,
 chap. ii.

‘ 8. An observed order of facts
 ‘ to be entitled to the rank of a Law
 ‘ must be an order so constant and
 ‘ uniform as to indicate necessity.’—
 DUKE OF ARGYLL: *ib.*

9. ‘ The phrase *Laws of Nature*
 ‘ may be understood to imply (1)
 ‘ that Nature is uniform, and (2)
 ‘ that this uniformity is a plurality
 ‘ and not a unity. There are sepa-
 ‘ rate departments, each with its
 ‘ own uniformities or laws.’—BAIN:
Logic, b. iii. c. ii. § 2.

NOTE XXI.

(Referred to in § 24.)

GRAVITATION.

1. Gravitation is a remarkable instance of implication—remarkable because it is popularly supposed to be the most stringent and powerful of all ‘causes.’ It will therefore exemplify the better the logicalness and conditionalness of the ‘necessity.’ The law of gravity states that all material bodies attract one another directly as the mass and inversely as the square of the distance. Now what are ‘material bodies’? No definition can be given except this, that they are things which attract one another in that way. The law of gravitation is therefore implied in the very definition of a material body.

2. Possibly this is hypercritical. It may be contended that there are a variety of things (objects of thought) in the universe—stones,

trees, houses, light, heat, electricity, mind, gas, &c. ; that a common property of attraction is found to dwell in a large class, which, for the sake of convenience, is designated matter. Is not this discovery concerning so large a class an important truth—a really *new* truth? And, moreover, it may be asked, were not material bodies classed together long before gravitation was discovered? Perhaps so ; and perhaps, on the other hand, the quality (openly stated or tacitly assumed) deemed essential to matter before the law of gravity was scientifically formulated, was really nothing but gravitation in another form.

NOTE XXII.

EXTRACTS FROM BADEN POWELL.

I.

(Referred to in § 36.)

[The intimate union which we imagine to exist between cause and effect] ‘ is no other than that of the
 ‘ particular individual case with the
 ‘ more general law : of that law
 ‘ with some still more comprehensive principle : and, of this, again,
 ‘ in its turn, with some yet more
 ‘ universal theory : thus establishing
 ‘ not merely sequences but reasons,
 ‘ not merely connexions but explanations. . . .

‘ If further confirmation of this
 ‘ view of the matter be wanting, we
 ‘ may find it in observing the dependence which the *strength* of our
 ‘ impression of an intimate causality
 ‘ always has upon the extent to
 ‘ which we trace the series of combinations of laws and principles.

‘ The force of the persuasion we
‘ entertain of causation varies with
‘ the different degrees in which
‘ the relations of physical laws
‘ are more or less general, more or
‘ less widely ramified and dependent
‘ one on another, more or less con-
‘ nected with high general prin-
‘ ciples and comprehensive theories.
‘ Our impression of the idea of an
‘ efficient cause is much weaker, for
‘ instance, in the case of friction
‘ and heat, than in that of gravi-
‘ tation and elliptic orbits, or
‘ tides.

‘ Suppose we should hear it re-
‘ ported that some substance had
‘ been found in which no violence
‘ of friction would produce heat; in
‘ estimating its probability prior to
‘ evidence of the fact, I believe no
‘ truly philosophic inquirer would
‘ reject it as a violation of the order
‘ of natural causes. But suppose
‘ it should be rumoured that a new
‘ planet were discovered, but that it
‘ did not move in an elliptic orbit;
‘ I imagine this circumstance would
‘ cast suspicion on the credit of the
‘ whole statement, in the minds of

‘ all who understood the nature
 ‘ of gravitation. . . .

‘ So firm is our persuasion of the
 ‘ uniformity of nature, that we can-
 ‘ not bring ourselves to believe in
 ‘ the capricious violation even of
 ‘ one of her laws ; we, therefore, are
 ‘ prone to regard the violation of
 ‘ several in succession, as absolutely
 ‘ contradictory and impossible.’—
The Connexion of Natural and Divine
Truth, pp. 104—6.

2. ♦

(Referred to in § 45.)

‘ Thus the consideration of a real
 ‘ cause, in fact, involves the con-
 ‘ nexion of one train of causes with
 ‘ another. The cause is shown to
 ‘ apply independently to one set of
 ‘ phenomena ; we refer another class
 ‘ to the same class. Thus we en-
 ‘ large our ideas of the connexion of
 ‘ physical phenomena ; we trace not
 ‘ only one series of causes and

‘ effects, but many, and these not
‘ independent, but united by common
‘ principles. We perceive a union
‘ between extended orders of facts.
‘ We find not merely one relation
‘ established, but a communication
‘ opened, as it were, with a vast
‘ range of such relations ; and many
‘ such channels of communication,
‘ widely ramifying in all directions.’
—*Ib.* p. 102.

* * * To those who have favoured me with a perusal of the chapter to which this appendix belongs, the similarity between the view of causation there expressed and that advocated in Mr. Powell's writings may seem to amount almost to identity. Were there no such phenomenon as *volition*, the similarity would be still greater. But it has already been pointed out (p. 82) that Baden Powell treated the phenomena of voluntary actions in a different manner from the way in which he dealt with other events : a distinction for which, I confess, I cannot see any sound reason.

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